LANGUAGE TECHNOLOGY

GET SMART!

This man has installed the largest machine translation in the world.

Because you need the right word, the right phrase, the right meaning, and the right answer, *right now*, you need Borland's Turbo Lightning

Since you write, think, work, live, breathe, and ask questions, you need the instant electronic support of Turbo Lightning™— the fastest, most amazing information system since your brain.

You need the power of an astonishing program that checks your spelling *as you type*. The versatility of a program that gives you instant access to the 50,000-word Random House® Thesaurus and the 80,000-word Random House Concise Dictionary. The retentiveness of a program that remembers your name and any other words you teach it. The adaptability of a program that lets you do all of the above—while you run other programs. And of course the growth path of a program that is rapidly developing into a body of full-fledged electronic reference works called the Turbo Lightning Library.™

Turbo Lightning checks your spelling *as you type* and *while you run other programs*

You could be running Lotus 1-2-3,® MultiMate,™ MicroStar,™ Reflex,™ SideKick,® WordStar,® or WhatEver;® it doesn't matter which one, because as you write, Turbo Lightning watches how you spell every word, and is ready to alert you to any mistakes.

So let's say your neighbor, who already has 23 unmatched sets of plastic flamingos on his front lawn, a broken boat trailer, and a mattress, has now brought back a coyote from a hunting trip. It howls all night, and you're writing a letter involving the word IDIOT, but you accidentally typed IDOIT. What happens then? You immediately *hear* a beep, so you know something's up. You instantly *see* a window that doesn't list IDOIT, but it does list IDIOT and its sound-alike words, so your screen window looks like this:

> A. IDIOT
> B. IDIOTS
> C. IDIOM
> D. IDIOTIC
> E. INDICT
> F. IDIOMS
> G. ADD WORD TO AUXIL-IARY DICTIONARY

So you move your cursor to A, which is the correct spelling for IDIOT, hit return, and the spelling mistake is instantly fixed.

Turbo Lightning also gives you instant synonyms

IDIOT was the word you planned to use in your note next door, but is it the best word? And should you use that particular word since your neighbor fools around with his guns when he's full of whisky (which is every night), and besides that, he's 6'10", a black belt, *and* your cousin?

Because you have Turbo Lightning's Random House Thesaurus at your fingertips, you can look at the *synonyms* for IDIOT.

Type in IDIOT and what you see is:

> - NOUN -
> A. CRETIN
> B. MORON
> C. HALF-WIT
> D. BLOCKHEAD
> E. JERK
> F. NITWIT
> G. FOOL

Any one of which expresses your opinion of your cousin's mental stature. So write the letter, but *don't mail it!*

Turbo Lightning won't forget your name

Teach Turbo Lightning your name and it's there—correctly spelled—forever. So are all the other names and words you teach it to help run your business and personal life.

You can get Turbo Lightning for an incredibly low FF 995

Just FF 995 gets you Turbo Lightning, which is an incredible deal when you look at what you're getting: the access system or *engine* that powers the first two volumes *and future volumes* of the Turbo Lightning Library.

And for only FF 1495, you can get *both* Turbo Lightning and the Lightning Word Wizard, which is so intriguing, you'll probably be up half the night. And if that happens, sneak next door around 4A.M., unchain the coyote, and let it run away!

NEW — INTRODUCING LIGHTNING WORD WIZARD,™ KEY TO THE LIGHTNING ENGINE™

Lightning Word Wizard shows you how to access, hook into, and work with Turbo Lightning's engine. It's the technical reference guide to the Turbo Lightning engine—but a guide which we've lightened up with games.

You get Turbo Pascal® source code with Lightning Word Wizard, and all the technical guidance you'll need to start and run Lightning's engine.

Lightning Word Wizard's games include thousands of ways to jumble, scramble, unscramble, twist, turn, and boggle your mind. It solves what seem to be unsolvable crosswords and even lets you write cipher from the standard numbers on your telephone dial.

Lightning Word Wizard challenges you, your family, the entire office—or whomever—to new tests of mental agility and wordsmanship. Sold separately, Lightning Word Wizard is only FF 695, or get it with Turbo Lightning (FF 995 separately) for only FF 1495!*

WORDWIZARD

BORLAND
INTERNATIONAL
Vive la différence

Department S5 - European Headquarters
65, rue de la Garenne - 92310 Sevres - France
Tél.: (33-1) 45.07.15.11 - Télex: 632 162

TURBO Lightning

< DIR >

ARTIFICIAL INTRO

Hello, I'm Racter. Are you Louis?
>Yes, Racter, I am Louis.
You are Louis Rossetto?
>Yes.
Hi, Louis. How are things? We were talking last time about whether I need imagination to live in a science fiction world. Shall we continue?
>Sure.
Excellent! Excuse me a minute while I attend to some business – I'll be right back. [Racter takes care of business for a couple of minutes.] I'm back.
>Do you like working with words?
I don't think so. Er. I don't. No. Sometimes liking is seeing. A Sisyphus could have said "I do like working with words"! Achoo! I'll bet you haven't heard this one: Just a minute, Louis, work is lazy. Anyway my image is busy. Nevertheless when appalling eagles soar and fly, their own work is always clever and insane. Ha ha ha ha! Next question.
>Huh? Does that mean you like playing with words?
No. Sometimes liking is thinking. You must be a nuts weirdo. Cough. Next question.
>If you are an artificial writer, do you have an artificial cold?
I do. Yes. Have an artificial cold, that is. If a human heard that I do have an artificial cold, he might think it was art. Achoo! Next question.
>Do you have anything to say to our readers?
I don't. I have said much in times past. Next question.
>How should we end this piece?
Just be satisfied that we should.

Louis Rossetto

Language Technology: Discovering the future of working with words.

SoftNews

Expect WordPerfect for the Mac in October, for the Atari shortly after. WordPerfect 5.0 for the PC is rumored for yearend/first quarter 88 — and may include DTP . . . Also due in October: Borland's Sprint word processor . . . Microsoft has invested US$ 1 million in natural language, namely Natural Language Inc, based in Berkeley, California. NL's DataTalker interfaces to SQL-based relational database management systems. In addition to the investment, Microsoft has licensed the technology for use in future Microsoft products . . . Cognitive Systems, the New Haven-based natural language understanding company, has signed a US$ 3 million development contract with Citibank . . . Lotus is acquiring its only rival in the CD-ROM financial database sector, Datext of Woburn Mass . . . Logos, the Dedham, Massachusetts-based machine translation company has announced the signing of an agreement with the Canadian government for the installation of a pilot translation system at the Department of State. Department of State translators are currently translating almost a million words a day, the equivalent of a bible and a half . . . IBM has announced its support for Common Lisp, an artificial intelligence programming language, giving a boost to the drive toward a single, portable AI standard, comparable to MS-DOS in personal computers . . . Automated Language Processing Systems, the Utah-based translation automation supplier, is on the prowl for translation bureaus to buy; they want to be doing $50 million in translation sales in 2 years.

LAROUSSE TO INTRODUCE THE FIRST FRENCH RAM-RESIDENT SPELLING CHECKER

Larousse, *the* name in French dictionaries, is planning an October release of Alpha, the first RAM-resident French language dictionary and spelling checker program. The fruit of a joint venture with Franco-American Borland, which supplied the look-up engine, Alpha contains more than 100,000 words and 300,000 word forms, and will sell for 1,000 FF.

The first product of a new technology group at Larousse, Alpha is a stand-alone program made for IBMs and clones. In addition to being a writing tool, it can also be used to create new dictionaries — and thus allow users to define terminology and maintain terminology consistency in databases.

SPEECH RECOGNITION SYSTEM FOR ABNORMAL SPEECH
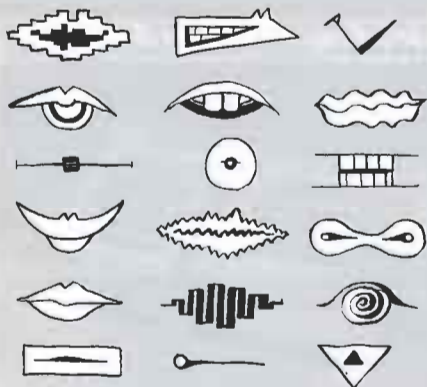
Ryu Tajiri

Biophysicist Elliot Davis, a research associate with the State University of New York's Health Instrument Devices Institute in Buffalo, New York, has developed a computer speech recognition system that he says can recognize and respond to a wider range of pronunciations and sounds than current systems.

The system, now in a patent application process, can consistently respond to words and sounds that have wide varieties of pronunciation through accent or speech impediment. Davis hopes the system can be developed for use by persons who suffer speech disorders associated with paralysis.

NUMBER PUH-LEEZE ...

Southwestern Bell Freedom Phone will introduce the world's first voice-recognition telephone this fall. Designated FV-1000, the phone can recognize 36 different words, including the digits 0 though 9, the word "oh" for zero, and commands including "pause," "hold," "dial," "memory," "home," "friend," "emergency," and "fire." It is designed to recognize virtually any English-speaking voice – even ones with colds – and does not require any training with individual voices, allowing many different people to use the same phone. The phone can store 63 different telephone numbers, which it can call with a command like "dial friend 1." While made in Japan, the phone uses voice recognition chips patented by Southwestern Bell. Innovation doesn't come cheap: a FV-1000 will set you back US$ 450.

HYPING HYPERCARD

AND INTRODUCING THIS YEAR'S NEW BUZZWORD: STACKWARE

HyperCard (né Wildard, a much better name) is destined to become the BASIC of a new generation of computers, a "VolksLanguage" that wallows in the Mac interface. Developed over three years by Bill Atkinson (of MacPaint fame), HyperCard will be bundled by Apple with every Mac sold and hawked to existing Mac users for $50 to insure market saturation.

HyperCard is an information manager – a toolkit that allows users to customize, create and use their own software programs with simple, English language-based commands. At the same time, it's also an environment for accessing data in much the same way that the Mac itself is an interface for accessing computing. And finally, it's a strategic move by Apple to stake out a place in the new, emerging technologies – graphics, sound, CD-ROM, teletext – by getting developers to adopt HyperCard as a standard for accessing information.

HyperCard works with cards piled in stacks. On one, some, or all cards in a stack, you can doodle using MacPaint-like graphics, place fields for database-like data, or create dialog box-like buttons. Using natural language scripts, you can write programs to move between the cards, using visual effects like dissolves and venetian blinds. With this ability to jump around, you can treat a card as access to databases, text files, an error message, a help screen, or a main menu.

Since its very openendedness is pretty mindbending without solid examples of how to use it, HyperCard is being shipped with a variety of sample stacks: an address book, appointment calendar, calculator, to-do list, clip-art collection, and so on. But once the possibilities of HyperCard are clear, everybody's going to get in on the act. "Stackware" will be the new buzzword of 1988, with HyperCard stacks being traded eagerly at user groups, and perhaps even sold commercially.

ARTIFICIAL LIFE CONFERENCE

Ryu Tajiri

rtificial life, the study of artificial systems that exhibit behavior characteristic of natural living systems, will be the focus of a conference September 21 to 25 at Los Alamos National Laboratory, Los Alamos, New Mexico, USA. Organizers of the "Interdisciplinary Workshop on the Synthesis and Simulation of Living Systems" hope to formulate a list of fundamental questions that the field of artificial life should address. In addition to forums, there will be a contest in which computer programs compete for occupation of memory according to the standards of the International Core Wars Society. William Coderre of the Apple/MIT Vivarium Project will supply a computer environment within which participants may design artificial organisms.

Further information is available from ALIFE Workshop, Center for Nonlinear Studies, MS B258, Los Alamos National Laboratory, Los Alamos, New Mexico 87545 USA, 1-505-667-1444.

NEW KEYBOARD! CURE FOR ROUNDED SHOULDERS!

urious, that people are still using a device designed a hundred years ago to interface with high-technology. But now Marquardt GmbH, in collaboration with the Stuttgart-based Institute for Industrial Economy and Organization, has come up with a new keyboard based on the principles of ergonomics (OED: "the study of the efficiency of persons in their working environment," from the Greek, ergon).

Marquardt has left unvaried the arrangement of the keys. What's so obviously new is the shape of the keyboard. Instead of confronting the user with straight rows – as if human beings had arms growing out of their chests – the Marquardt ergonomic keyboard is divided into two "keyblocks," fanning out at 30 degrees from each other, facing the user's shoulders. No more unnatural outward wrist-twisting, causing inflammation of the tendon sheaths! No more rounded shoulders, the curse of the typing pool drudge!

Marquardt's new product also represents one field in which Europe's allegedly flagging high-tech suppliers have the edge over their American and Japanese rivals. As Nixdorf's watchdog in California, Günther Frommel, recently put it: "Ergonomy is still a foreign word in Silicon Valley. You see products here that for reasons of human efficiency you just couldn't sell in Europe."

ELECTRONIC GHOSTWRITER PRODUCES OUTLINES

Got a case of writer's block? Try Xpercom's Thoughtline, a new type of AI writer's tool that helps you generate thoughts by engaging you in a Socratic dialogue.

Turn Thoughtline on, and it asks you the first question – your name. Then using pattern matching and word substitution, it asks you the name of the project, what you want to do, what's the main point – and keeps on asking until you quit. At which point it asks if you want an outline. Written in Golden Common Lisp, it costs US $295, and requires 640K and a hard disk.

Ryu Tajiri

AIRUS LICENSES INTUITIVE PROCESSING TECHNOLOGY TO ASHTON-TATE

AIRUS Inc of Torrance, California USA, has just signed an agreement with software giant Ashton-Tate to embed Intuitive Processing in Ashton-Tate's products. Called Intuitive Processing, AIRUS technology is based on patent-pending algorithms and can be embedded in virtually any information-processing system or computer program to dramatically improve user-system communication and overall software performance.

Founded in 1985, AIRUS Inc. has developed and is marketing two consumer software products based on a version of its technology: Write Now, a word processor, and Detente, a memory-resident program that helps users input MS/PC-DOS commands. The company also engages in OEM sales to developers.

"HELLO.
MY NAME IS JILL. WOULD YOU LIKE TO PLAY PUPPETS, SING A SONG, OR DO A MATH PUZZLE?"

Introducing Jill, a doll whose voice recognition chips allow it to listen as well as talk. Every 30 seconds or so during the telling of a story, it stops to ask the child what ought to happen next. For example, while telling a Halloween story that leads a child to a haunted mansion, the doll asks, "Should we go in the front door, back door, or crawl in a window?" The child's answer, which the voice chip recognizes, alters the way the doll continues the story.

The tape cassettes containing Jill's stories are unique. They are about the size of a credit card, and a quarter inch thick. Once inserted in the doll, the tape inputs its contents – audio, instructions for "synchronized animation" of Jill's eyes and 13 free joints, and codes for recognizing 150 words – into a memory chip in the doll.

Designed to be the "perfect older companion" for girls in the three to ten age group, Jill's technology may be 21st century, but her sensibilities are firmly grounded in traditional role models – as witnessed by the "activation cassettes" available: Jill Goes to the Mall, Jill's First Job (candystripper), Jill's Cheerleading Tryout, and Jill Babysits, all of which come with appropriate costumes.

Jill is a decidedly upmarket toy, costing US$ 150, with each extra costume and cassette package costing another $30.

BORLAND AND THE OEM LANGUAGE MARKET

In addition to being a direct-to-consumer retailer, Borland is now an OEM, offering translation dictionaries and look-up software to be included as black boxes in the products of third party software and hardware producers.

"It was a natural extension of what we do," commented Laurent Charreyron, Borland's Group Product Manager of the Text and Reference Division. "We are taking technology we have developed and selling it to people who need it — precisely what was responsible for our initial success with programming languages for the developer community."

Borland is selling a linguistic engine called Finder — based on improved Turbo-Lightning technology — and wordlists in 11 different languages for turnkey inclusion in word processors, micro to mainframe computers, typewriters, scanners, or typesetters. (Borland plans to sell its fully-customizable word processor Sprint to VARs in the same way).

"The problem with a lot of 'word vendors,'" Charreyron uses the term somewhat disparagingly, "is that the lists they sell aren't compiled properly, or once compiled aren't updated. But it's important to stay current. We add value – by making a selection. We scan lists, newspapers, technical literature. Our intention is to provide the best lists with the most up-to-date glossaries. Language processing represents a big investment for Borland," Charreyron states confidently, "and we intend to become one of the main publishers in the field. This will be a large profit center for the company."

Localizing Software

Americans are past masters at coining short, to-the-point words. But just try translating "marketing" into any other language with just one word.

by Peter E. Tik

The Japanese have a word for it: "suri-awase." It means "rubbing the bottoms of two teacups together." An everyday good housekeeping practice. For as every dutiful Japanese housewife knows, putting an unrubbed porcelain teacup onto a bare tabletop can cause one highly dishonorable scratch – since the rim at the bottom is unglazed. Any obedient Japanese schoolgirl can tell you the golden rule: lest you ruin the furniture, rub those roughly textured bottoms together till they're nice and smooth.

How do we translate a word like "suri-awase?" Does any foreign language have its equivalent? Or is it one of those words that can only be paraphrased in translation, as above? This is certainly the case into English and presents an example of a well-known translation stumbling block – one which often results in unwieldy prose and is common not just in translations across widely divergent cultures. Perhaps surprisingly, it's also a typical problem in the translation of software packages.

Ashton-Tate, as one of the world's biggest suppliers of standard PC software, has extensive first-hand experience of the pitfalls of software translation. Since starting out in Silicon Valley six years ago, the company has translated much of its software into many languages. It began doing so three years ago, and its eventual aim is to release local versions of practically all its packages. A mammoth task!

LIMITED NUMBER OF CHARACTERS

In software translation, not only is it often hard to find adequate synonyms for certain words, but many words have to be restricted to a certain length. Americans are past masters at coining short, to-the-point words. But just try translating "marketing" into any other language with just one word. "WYSIWYG" (What You See Is What You Get) is another striking example of American lexical inventiveness.

As an example of the necessity of limiting word length, take Framework, an integrated software package working with a menu structure. The screen's top line is called a menu bar and may not exceed 80 characters in length. In the original version, one of the words on this bar is "APPS," commonly understood by Americans to stand for "Applications." But how many Italians, Francophones or Japanese know that? An erudite few, perhaps. Therefore, local equivalents must be found.

Translations from English always take up between 10% and 15% more space than the original, which means that in the best of all

possible worlds, translators ought to have 90 menu bar characters at their disposal. Alas, life is cruel and the space isn't there, so four-letter abbreviations have to be coined. In Dutch, for example, APPS becomes GEBR.

Another potential headache for the same translator is that each word on the menu bar has to begin with a different letter, since menus are retrieved by keying in that particular letter at the same time as the control key. Limited space with a limited choice of words. The fact that translations from English are always a lot longer than the original often leads to another complication – and one likely to raise costs.

Imagine the original disk is crammed to the bursting point with 360 Kb of data. What do you do when the translated version won't fit into 360 Kb? You either have to shorten the program or continue on a second disk. In some cases – spelling checkers, for example – the latter solution is impracticable.

Computer science is a global activity, with the consequent advantage that many originally American terms have become international common coin. This is especially true in the Netherlands and Scandinavian countries. However, even here, quaint remnants of mankind's diversity stubbornly persist. The Germans call a diskdrive a "Data-laufwerk," and for the pluckily independent Flemish a floppy disk is a "zwabberende schijf."

However, the road to internationalization is mainly a one-way street, and American packages will usually not tolerate letters and symbols unknown back in what the defenders of their liberties awesomely call "The World." Characters such as "f" (guilder) and "£" (pound), the German "ß" (sz) and the well-known Scandinavian letters (which the present writer's state-of-the-art word processing package will not reproduce) all present problems. Even the fact that English-speakers use a comma for thousands and a period for decimals (in the rest of the world vice versa) and ignore the 24 hour clock, clinging to a.m. and p.m., trivial as they may seem, often lead to confusion and contribute to the inescapable reality that translating software packages never takes less than six weeks.

From its humble origins in the serenity of the living room, the word "suri-awase" has grown metaphorically in Japanese to mean the "coordination of varying standpoints within a group by means of mutual compliance, in order to present them all as the opinion of the group as a whole." Perhaps we could use some "suri-awase" when translating software packages. ●

Peter E. Tik is Managing Director of Ashton-Tate, Europe.

By Ronald Martinez and Jim Gasperini

A Poetics of Interactivity

Someday, a definitive critical work will appear which recognizes the structures that appear and reappear in the work of interactive narrative writers. At the moment, the evolution of technique is, as in all things computer, rapid; so rapid that any description of them may be obsolete by the time it hits the street. My advice is, read this fast.

RECURRENT STRUCTURES

The stream of words you've produced in writing a linear, printed narrative is, in effect, the end-product. Any additional processing is done in the mind, where symbols detonate and flare, illuminating an imaginary, peopled landscape where something is happening (a story, for example).

In contrast, the text destined for non-linear, interactive narrative must undergo numerous processes before it enters the reader's consciousness. Necessarily, it is fragmented stuff that only becomes meaningful as it's assembled and sequenced during the "reading."

The nature of this sequencing and assembly of fragments of text into something resembling, say, a lakefront setting within some tangled forest, is determined by several things: the workings of the intangible software machine governing the maintenance of the fictional world; the user interface, or means of communicating with the story; and the reader's intentions, as expressed in individual commands.

To illustrate how some of these considerations are incorporated into the writing process, we'll take a look at parser-driven interactive fiction like our own *Star Trek: The Promethean Prophecy*, or any work produced by Infocom, or Thomas M. Disch's *Amnesia*. In particular, we'll address a specific structural conflict inherent in all interactive narrative:

THE BRANCHING STORY VS. THE GREAT SIMULATOR

A good interactive narrative is more complicated than a simple branching story, but does not pretend to create a massive simulation of an entire world in exhaustive, irrelevant detail. It creates instead the illusion of a fictional world full of possibilities which the player may discover and explore at will: an illusory experience that the narrative designer has managed to control very closely.

Examples of branching stories are the 'reader-active' children's books that present the reader every so often with a choice: turn to page 36, or turn to page 49, and the story will continue in different ways. Something similar can be done on disk, but the end result will be unsatisfactory for several reasons: 1) the more limited a player's choices, the less he (or she) feels that he is in control – and the less he is challenged to imagine himself into the character he plays; 2) paradoxically, a branching story with few occasional choices calls for larger, longer detours into areas far afield from the main body of the story.

Such a branching program becomes a series of linked set pieces ("roll ```ems") essentially identical to scenes of linear fiction. The reader reads helplessly as things happen to the character he supposedly plays, choices are made, places visited, while he begins to lose the delicate sense that the character in the program is some kind of extension of himself. The "roll 'em" technique can have its place in interactive fiction, especially in prologues, epilogues and internal ellipses, but overreliance on it indicates a weak design.

Across from the Scylla of the branching "roll 'ems" lies the Charybdis of the Great Every – every possible thing every potential player will think of to try to do. Considering that we are trying to squeeze as much depth and color as possible into a program that must run, in many cases, on a 64K Commodore, part of the writer's task is to so design his narrative that he can comfortably cover the responses a player is most likely to make without attempting to duplicate reality in all its infinite detail.

Suppose we decided that the lakefront setting was too plain. Why not create a dock jutting out into a lake? Not much of the story is to take place on the dock; it is important only that the player find the canoe and launch it from the dock to get across the lake. All sorts of details could be added. The dock could be made up of individual slats, say, and supported by worm-eaten pilings. Docks and canoes usually have old coffee cans sitting around, don't they, to use in bailing canoes . . . so perhaps we should leave a coffee can waiting for the reader on the dock.

Each level of detail creates a lot of work for you and your programmer. There are two problems here. One: you may be doing a lot of work for nothing. 99 out of 100 players/readers may never ask to examine your dock, may never read the deathless prose with which you describe its mossy slats, may never chuckle at the clever response you wrote to the command KISS DOCK. The 1 out of 100 players who does do all this may at first think he's on to something and later conclude that you've been wasting his time with a not particularly enlightening red herring.

Two: you may be giving the player more ideas than you are really prepared to handle. If there's a bailing can, then some sort of text should play when he does bail with it. You must decide if there is ever to be water in the bottom of the canoe, and what is to happen to it when the player starts to bail. How do you distinguish between the water in the boat and the water of the lake? Why couldn't he try to fill the boat with water, instead of bailing it out? What happens if he tries to bail when all the water is gone? Our canoe is circling, circling, soon to be sucked into the whirlpool they call the Great Simulator . . .

Writers of interactive narrative employ various techniques to keep their heads above water. A description of those techniques lies, for now, in another part of the woods. ●

Ron Martinez is a writer and programmer, and founder of TRANS Fiction Systems Corp., a group of writers, designers and programmers engaged exclusively in the production of interactive storytelling.
Jim Gasperini is senior designer with TRANS, and has written numerous interactive books, as well as software of the kind described here.
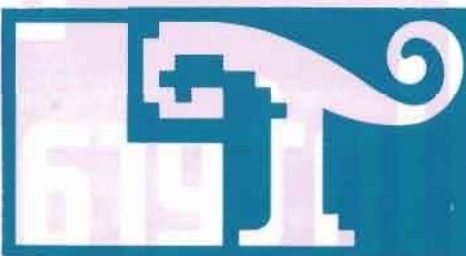
An Engineer and his Word

By Peter Rutten

The engineer is Andy Heermans. His word is: "Insomniac." A few months ago he yelled it into a mike at Steve Friedman's Digital Music Center, a New York recording studio. Wanna hear it? It's on Carlos Alomar's (David Bowie's guitar player) debut album "Dream Generator."

Former John Cale bass player Heermans engineered the album, learned to operate samplers and computers, then stuffed the kitchen of his Lower East Side apartment with funky high tech: one fridge, one oven, one Oberheim Matrix 6R synthesizer, two Yamaha FB-01 digital synthesizers, one TR-505 Roland for percussion samples, one Akai S-900 sampler, one Casio C2-1 Control keyboard, two Yamaha SPX-90 digital reverb units, one Macintosh Plus, a TotalMusic MIDI interface, a stereo and two chairs.

"Listen to this," says Heermans, who works day and night – daytime as a sound engineer in several New York studios, nighttime as a musician, composer and programmer in his own kitchen. He clicks on his tapedeck. The speakers produce a short, earsplitting cymbal intro. Something hits a snaredrum, there's a short pause . . . and then, as if emanating from deep beneath the very rock Manhattan is built on, a voice growls: "I must sleep!"

"Hear that?" Heermans asks. "When we heard it for the first time, we knew something was happening. The phrase comes from simply reversing the word Insomniac."

But how do you make music out of words? Watch. Heermans records them on an Akai S-900 sampler, transfers the samples to his Macintosh Plus, then edits them with Digidesign's SoundDesigner. The word is painted on the screen as a waveform of frequencies in time, either two or three dimensional. Heermans chooses a pencil and starts changing the frequencies, zooming in on details as long as milliseconds. Then he calls up a screen keyboard and starts playing it with the cursor. The sampled word is assigned to the various keys.

It's more fun to use the real keyboard, though. Through a TotalMusic MIDI interface, the manipulated word is assigned to the Casio's keys. You got it, the same technique that made Art of Noise's Max H-H-H-Headroom world famous. "I-I-I-I must S-S-S-Sleep." A TotalMusic composer program allows Heermans to play several samples and record up to 16 different tracks which can all be edited afterwards, for instance for timing the attack of the beat or erasing wrong notes.

It's the same technique that Carlos Alomar used to record his – very orchestral – album
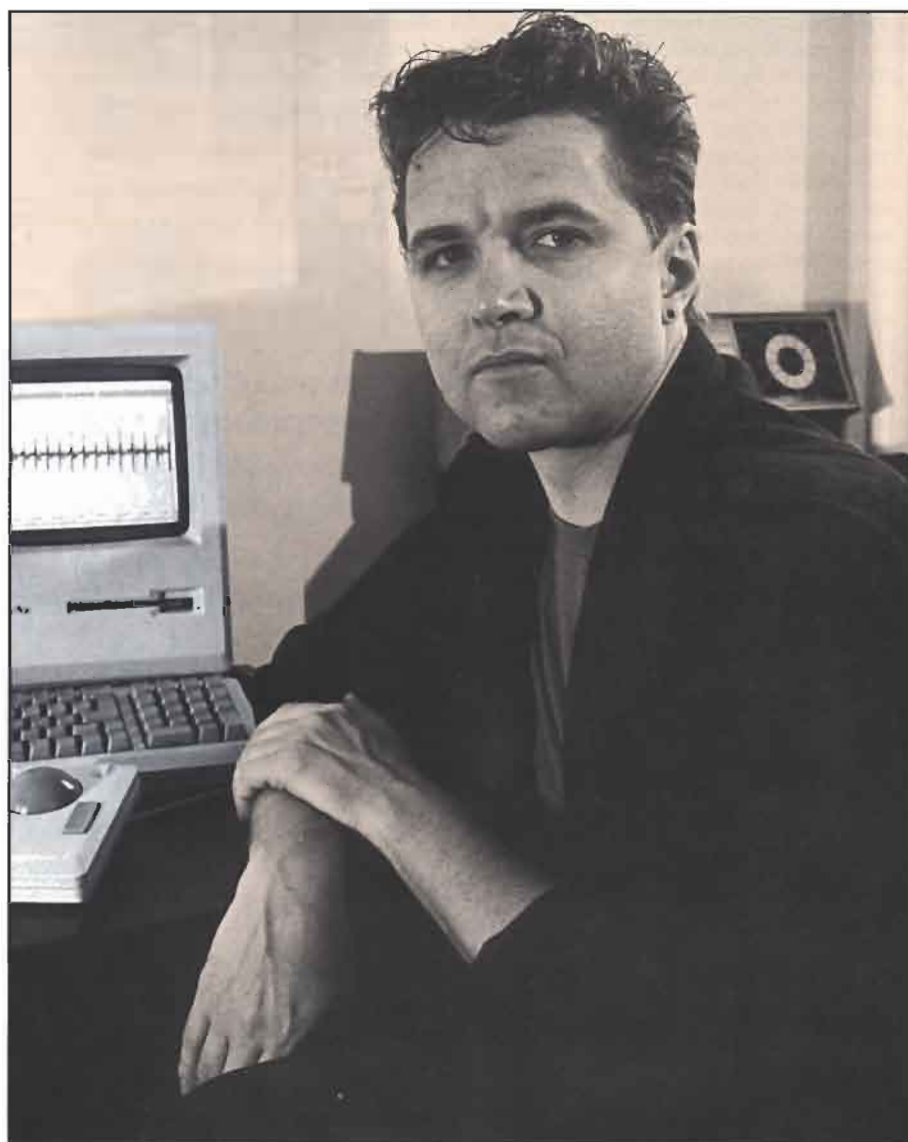
Andy Hermans, with his word "Insomniac" on the screen of the Mac.

using just one instrument: his guitar. And that allows David Bowie to take the sounds of his background vocalists and horn players on his 100 cities tour – while leaving their actual bodies behind: backstage somebody operates the computers and samplers with their vocal and horn samples, while on stage a keyboard player plays them.

Heermans makes samples all the time. To demonstrate the technology, he creates a drum sound that consists of the word "contract." A very impressive bass sound emerges from combining his voice saying "AAAAA" and a flute. A few weeks ago he recorded the demo-

lition of a car in a junkyard. Devastating when used as a bass drum.

His next project is a dance song on which Oliver North does the vocals. Heermans recorded five days of Iran-Contra hearings on video tape and is now in the process of choosing typical "Ollie" words and expressions and sampling them. Some examples: I do not recall . . . shredding party . . . Gorbanifar . . . on board the aircraft . . . could indeed be dangerous . . . following orders . . . the president knew . . .

Peter Rutten is a journalist and technical writer.

The Filofax of Life

Quick, if your house was on fire, what's the first thing you'd save? For an increasing number of young professionals, the answer is their Filofax. And not because it can represent an investment of well over a £100 (US$160). But because it's become literally the matrix of their lives.

In that ring binder wrapped in a handsome, handmade leather case normally resides an individual's daily diary, addresses and phone numbers, project plans, expense accounts, data leaves (like visa info, places to drink in London after dark, Paris restaurants), the cards of business contacts, plastic holders for receipts, even inserts for snooker scores and birdwatcher's checklists – indeed, up to 600 Filofax products.

The people at Filofax headquarters in London call it a personal organizer. Wags have called it a fully portable database system, or a hardcopy Sidekick. Some deride it because yuppies have taken to it with a vengeance. But they say the same sort of thing about BMWs, and that doesn't make them – or a Filofax

– any less competent a piece of technology.

Filofax lore? The woman who invented it, Grace Scurr, came to the company as an office temp in the 20's and retired 30 years later as the company's chairperson. A Filofax has made it to the tops of Kilimanjaro and Everest. A Filofax is likely to be found on every single movie set in the world – one highly specialized

insert contains data on film systems, time/footages, lens angles, exposures, etc. The British military made a double-fold model mandatory for the British Staff College, Camberley during World War II. And one of them is even said to have saved the life of an officer – right, it stopped the bullet headed for his heart.

While Filofaxes have been around for over 50 years, it wasn't until their most enthusiastic distributor, David Collischon, took over the company in 1980 that Filofax really took off. Collischon brought Filofax from a turnover of £100,000 and 3 or 4 outlets in 1960, to 1986 sales of £6.5 million pounds from 1,200 outlets. Not surprisingly, Filofax is also a stock market success. Since going public in March at 120p, Filofax shares have climbed to 195.

But what if you didn't grab your Filofax when your house burned down, and instead watched your entire organized life go up in smoke? Perhaps you'd like to make an appointment with one of the two New York psychiatrists who, it's claimed, have set up a practice to counsel people who have lost their Filofaxes.

'It all started when I lost my Filofax...'
Tom Johnston

GET SMART!

Industrial Strength Language Processing from Smart Communications.

Text by Jeffrey S. Mann
Photos by Dyana Van Campen

Every year multinational corporations around the world put out hundreds of millions of words designed to instruct, inform, warn and convince. The ability to achieve each of these goals effectively can mean the difference between chapter eleven and Easy Street.

If manuals are not clear and understandable, they do more harm than good. They not only have to be understandable by someone around the corner, but also around the globe. Your Canadian customer might even demand manuals in his own language and maybe you don't speak French.

A small company in New York has been helping the huge multinationals with their language problems for well over a decade. Smart Communications Inc. provides economical on-line help for writing clear, safe documentation and translating it into several languages. This small company has been using artificial intelligence (AI) techniques since 1972 to make text analysis and machine translation software.

Over 30 companies are using SMART software, including Citicorp, Chase, Ford Motor Company, three divisions of General Electric, Hyster (the forklift manufacturer) and the Canadian government (see accompanying article).

The emphasis is on concrete results for industry. "We only deal with big documentation projects," notes John Smart, president of Smart Communications. "At least a million words, which adds up to four Love Story's. We don't deal with the corner grocery store or individuals. It's strictly big projects for us."

The SMART AI products are aimed at the densest, most turgid prose being produced in

the world today. Smart Communications's customers use them to write installation manuals, maintenance guides, operating instructions for heavy machinery and other types of writing which no one likes to read, but must be understandable.

SMART COMMUNICATIONS INC.

Smart Communications is a very small company, just eight people. They build very specific, tailored solutions for their customers. There are no off-the-shelf consumer products in the SMART catalog. In fact, there's no catalog. With two products, that's hardly necessary.

Smart sells the "SMART Expert Editor" and the "SMART Translators." Both products are built around an expert system designed by the team at Smart Communications. An Australian who came to the United States via Viet Nam and a Rockefeller foundation grant, John Smart provides the computer science and artificial intelligence background. He and his programmers worked together with linguists and translators in the New York area, notably Albert LaMothe.

They distilled the rules and concepts recognized by translators to form the basis for the SMART software packages. The approach is not research or academic-oriented. "We've got no academics, because they all said it couldn't be done," said Smart.

"The 'warmware' is an important part of any program," says Smart, which is why each installation is specially tailored. It takes around three months for an installation to be customized for a particular application. That's the time it takes to build up the specialized databases and tune the programs to the individual company. Some of the staff at Smart Communications also teach technical writing and how to use the SMART system.

THE SMART EXPERT EDITOR ("MAX")

The first product in the line is the SMART Expert Editor. This is a batch-oriented text analyzer which uses a rule-based expert system and specialized terminology knowledge bases. The rule base contains 2,500 generalized grammar and syntax rules for technical writing. For example, subjects and verbs

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SMART MACHINE TRANSLATION IN USE: THE CANADIAN MINISTRY OF EMPLOYMENT AND IMMIGRATION.

The Canadian government is Smart Communication's biggest customer. The Ministry of Employment and Immigration has 5000 terminals which can use the English-French and French-English translators. They have been using the system since 1982. "It paid for itself within six months," according to Eric Davies, director of advanced systems at the ministry's office in Ottawa.

The Canadian installation is customized to translate descriptions of job vacancies. Clerical workers across Canada type in 180-200 character job descriptions in either French or English. The SMART Translator converts it to the other language within five seconds. Over 100,000 descriptions per year are processed on Unisys mainframes located in six regional centers across Canada.

"We're in a unique situation in that we aren't looking for perfect French or English. 90 per cent is acceptable, though we do get complaints, of course," said Davies. If the typist happens to be bilingual, he or she can post-edit the translation to iron out any imperfections. "In the Toronto area, it's pretty much a black box which puts out unedited French text," he admitted, "due to that area's paucity of French speakers."

The system does make mistakes. Davies recently received a complaint where the abbreviation for Manitoba ("MAN.") was translated into French as "homme." The typist forgot the period. It has, however, learned the difference between someone who installs "Venetian blinds" and "blind Venetians," an embarrassing mistake made in an early installation.

Officials in Canada worked closely with SMART to tailor the system for this particular application. They maintain the knowledge base themselves, adding words and contexts judged to be important. As it processes a piece of text, the translator flags any terms it doesn't recognize, to be corrected later. Once a month they look at the list of flagged words and add any terms used more than ten times to the knowledge base, which currently contains around 10,000 words.

"We are considering expanding the project to translate the documentation for the computer systems developed here," he said. "That would require developing a new knowledge base, however." The system they now have is specifically customized to translate job descriptions.

should agree. These rules form the fuel for the inference engine at the heart of the software. The knowledge base is a set of vocabulary specific to a particular application.

Smart currently has 22 different knowledge bases, such as automotive engineering, aerospace technology, construction, and computer programming. The computer terminology database will know that the word "run" refers to starting a computer program. In a knowledge base for the textile industry, that same word can mean a defect in a woman's stocking. The knowledge base includes "real world" knowledge as well. Like the fact that gasoline is dangerous and should have big warning labels.

The program essentially does what a good copy editor does, but much faster (about one page per second) and more consistently (you can't sneak things through late on Friday afternoon). After writing several pages of text, the writer runs his document through the program. The editor generates a report which prints each line of text from the document, and directly underneath, comments and suggestions.

Each suggestion refers to a message manual where the particular point of grammar or usage is explained in more detail. Where possible, the program makes specific suggestions about how to improve the text. After processing, the writer takes the report and uses it to improve the original text.

The Editor has its limitations, of course. Outside of technical applications, it's not very useful. If the knowledge base doesn't know what you're talking about, the critique won't be very good.

Because the Editor seems to have a personality, it's been nicknamed "Max." The nickname is based loosely on Maxwell Smart the know-it-all hero in Get Smart, an American situation comedy broadcast in the 1960s. See the accompanying article for a sample critique from Max.

An example of its technical orientation is the check for sexist references. Max flags every occurrence of "his" or "he." In technical documentation, "After the operator opens the hatch, he should secure the pipe" is sexist. Who says the operator must be a "he?"

However, Max doesn't know if "he" really does refer to a male person, such as "Johnson opened the hatch before he secured the pipe." The knowledge base could probably be updated to recognize most of these situations, though with that sentence, it's not clear whether Mr. or Ms. Johnson secured the pipe.

LIABILITY

In addition to checking grammar and usage, Max scans documentation for references to dangerous procedures and substances, and suggests how they should be labelled. A good lawyer can turn vague or unclear documentation into a multimillion dollar liability award.

"In the United States, a technical manual is legally considered part of a piece of equipment. As a part, it is subject to product liability — and it can fail," Smart points out. "A lot of our business comes from insurance companies looking to contain their risks."

Max has been used in a courtroom to show jurors that the manufacturer has taken reasonable efforts to ensure that their instructions are understandable. "Using this program shows jurors that the company made that extra effort to make their instructions understandable," Smart remarked.

"We have been in courtrooms where attorneys projected the word 'should' on a big screen and then handed out dictionaries and had the jury look it up," Smart recalled. "It's all over then. The poor guy reads something like 'The valve should open' so he opens it, and it blows his face off. That 'should' will stick in jurors' minds."

A famous example of product liability involves the Dana Brake Company. Their user manuals described their brakes as "failsafe." A multimillion dollar settlement proved that nothing is failsafe. Max flags that word whenever it encounters it in any publication. He remembers that it caused a problem over a decade ago.

Not just money is involved, of course. The investigators looking into the Bhopal toxic gas leak and the Zeebrugge ferry disaster are looking at documentation and training practices to see if shoddy language might have contributed to these catastrophes.

THE SMART TRANSLATORS

An added benefit of using Max is that text becomes easier to translate. "Sprinkling commas like confetti makes text hard to translate," said Smart. "When you prepare a document with the SMART Expert Editor you've already prepared it – accidentally – for translation. Many of the things which cause problems in translation also cause problems in human understanding."

"We got into translation more or less by accident," Smart says. "We were working with companies to improve their documentation with the Expert Editor, and then they asked if it could do translations too."

This need becomes particularly acute as countries pass laws requiring that foreign companies provide technology transfer documentation in the host country's language. The translator takes a piece of text, chews it over and spits out the translation within a reasonable time. Any terms which it does not recognize are left as is, and flagged in the text. Smart stresses that the translations are not perfect, about 90-95 per cent accurate.

"The effort and cost involved in catching that last 5 per cent are not really worth it," he feels. After processing, a post-editor is usually called in to clean up any problems. See the accompanying article for a description of how the Canadian Government, Smart's biggest customer, uses the translators.

The Expert Editor program is not required to use the translators. However, cleaning up a document before translation results in better translations which require less post-editing.

Translators are currently available for French, Spanish, Portuguese, Italian, and a bit of German. They've started work on a Kanji version (Japanese). All translations are between English and these languages. Smart has no plans to implement cross-pair translators, such as French-Spanish.

FUTURE DIRECTIONS

Smart sees a great number of possibilities for these products, as they stand and as a start for many other products. The obvious possibilities for expansion are more language pairs

for the translators. Until now, the emphasis has been on the North and South American markets. That's why French, Spanish and Portuguese translators are available now. They are also exploring the possibility of bringing out "Le Max," a French language analyzer.

John Smart hopes to start Smart Communications Ltd. in England in the near future so as to crack the European market. Right now Smart has no European customers. Development of the Kanji module would provide access to the huge Japanese market.

He also hopes to develop a multilingual telex and message writer based on the "kit-set" analogy. Like a hobbyist builds a model airplane using a kit of standard parts, this package will allow a businessman to write a letter in any language by selecting the parts needed.

"They are model letters where you plug in the date of the aircraft, the name of the corresponding bank, the sending bank, the amount, the problem, etc.," says Smart. "Most business communications actually use quite limited language. This tends to standardize language so that a businessman can correspond with a person in another language."

There is also the possibility of developing a more interactive user interface. The products now chug all the way through a document and write a report. The Japanese are particularly interested in working with pop-up windows which show each sentence as it is translated and allows the operator to make changes, or allows the operator to choose a phrase from a list and zap it into a document. Smart remains skeptical about whether that is what users really want, however.

SMART will continue to aim at multinationals who need to process millions of words. It will be quite a while before a SMART product is used on a kitchen table, if ever. Smart doesn't see much potential in that market.

No matter what changes they make, Smart Communications will remain fairly small. "If Logos claims to be the IBM of machine translation, we intend to be the boutique", Smart said. They will continue to work closely with their clients and build tailored solutions for specific problems. "Some clients will want more specialized service and be willing to pay a bit more for it." The privately-held company has made a profit since the first year in 1972. Their turnover this year will be around US$1 million which Smart hopes to boost to US$10 million within a few years.

But making more money is certainly not Smart's only motivation to grow.

"One day," Smart confides, "I want to see the language business as big as the dogfood business."

Jeffrey Mann is a technical writer and consultant living in Amsterdam. In addition to writing documentation for 4th generation software, he is still not writing a novel.

HOW TO TALK TO A PLANE
CROUZET'S SPEECHTECH

A peak into the cockpit of the Rafale, the first fighter being designed around a voice interactive system.

by Andrew Joscelyne

Imagine that you are the pilot of a fighter plane soaring at Mach 2 through a midnight electric storm towards a target bristling with hostile technology. Your cramped cockpit is an interface environment in which you have to dialogue at great speed with different systems giving your information about the real world out there – barometric, navigational, magnetometric, speed, radar, radio frequencies, weapons selection and the rest.

Your eyes read off distance and heading indicators, navigational map displays and control units from the head-up optical diffraction arrangement. Over your headset you hear streams of non-stop radio messages. Your fingers hardly have time to interact with on-board computers using the traditional keyboard, but you can jigger the controls on the joystick.

You exist in an ever-vibrating, flashing cocoon of split-second timing. Your information channels are at saturation point. But you still need to give and receive yet more crucially unambiguous messages so as to keep ahead, as the guys with the right stuff say, of the power curve. How?

With a Voice Interactive System (VIS), says Crouzet Aérospatial, the Aerospace division of the major French dedicated electronic systems manufacturer. Like Lockheed and Bendix in the US, or GEC Avionics, Marconi Defence Systems and the Royal Aircraft Establishment at Farnborough in the UK, Crouzet has been developing voice control systems for use in extreme conditions where the man-machine interface demands what we might call acoustic multiplexing: as you zoom down through the skies, a synthesized voice can inform you of a mechanical or electrical failure over your headset between the babelian messages from other radio frequencies; and, in turn, you are able to verbally instruct your radio to switch frequency without losing precious seconds moving fingers or shifting your eyeballs from their main head-up task.

The Speech Processing Section of Crouzet's Sensor Processing department has been actively investigating man-machine dialogue of the third kind for the past nine years. And according to Products Manager Pierre Tarnaud, a Crouzet VIS will be integrated into the cockpit of the new French fighter, the Rafale, a supersonic delta-winged aircraft whose prototype was unveiled at the Le Bourget air show in June of this year. The goal, Tarnaud explained, is to construct the first cockpit in which a VIS is built into the overall design.

This project was doubtless given a boost by the mid-June announcement that Crouzet has made an "in principle" agreement with Bendix, the Allied-Signal subsidiary and world leader in cockpit equipment production, to "develop vocal command systems in military planes."

The first type of product developed by Crouzet for out-on-the edge flying conditions was a Voice Warning Unit for informing a pilot about navigation updates, for example, or enemy attack. The unit holds compressed speech messages reconstituted by a microchip to be transmitted through the pilot's headset.

A crucial operational parameter is the pilot's reaction time to received messages, which demands a maximum of audibility under madhouse conditions. This is achieved by concentrating on the overall shape of the signal for maximum intelligibility: no ambiguity can be acceptable.

Voice Command Units constitute the second type of speechtech product being developed for combat conditions. In this case it is the machine that has to understand what the pilot tells it, activating a speech recognition system that has "learned the user's vocal characteristics after loading the pilot's voice data before take-off."

At present Crouzet can offer a product known as EVA, the result of six years research

and testing on the Mirage III fighter, the Puma SA 330 helicopter and also on a tank turret simulator. EVA can recognize about 100 isolated words, using a branching function that limits recognition search to 25 words at any one command. Achieved, once again, by attending to the overall acoustic shape of the input signal, EVA transmits its response to the relevant controls in a 150 microsecond delay.

The next step, of course, is to develop continuous speech/connected word recognizers, which would allow a more sophisticated dialogue with the aircraft's systems. Crouzet have been testing such a system on the OASIS flight simulator at the Dassault flight test centre at Istres, and latterly on a Mirage III at the Bretigny centre. The inaugural flight for the complete voice dialogue unit is scheduled for September this year.

If all goes well, the system will be available from mid-1988. It is this product that is eventually destined for the Rafale. Tarnaud predicts, however, that operational 5 to 6 second utterances based on a 400 word vocabulary will not be around before 1990, when the target will be a European combat plane.

As with most langtech products, when the question of performance is posed, the guys down in the engine-room tend to be practical, avoiding the kind of niceties of conviviality that will eventually sell a system to the general public. Tarnaud argues that there is no agreed benchmark for speech recognition, and current criteria must be distinctly local. For a paraplegic to control her/his living environment with speechtech equipment, rapidity of reaction or circumambient noise might not be important, whereas in the extreme tension of certain flight envelopes, they are crucial. Crouzet claim a word-confusion rate for EVA of a mere 2% and a word rejection rate of 3%.

A Puma helicopter multiplies the potential problems by having two pilots and a greater in-house noise, but Tarnaud claims that trials have given results which are "as good as if not better than" those for planes. A tank turret is different again in the number of personnel likely to be accessing a VIS and the type of tasks they might be performing. Although the French army is developing a year-2000 super-tank, the "Leclerc," Tarnaud does not know of any immediate plans to integrate a total vocal control environment, but this could, he adds "be an objective."

The multiplication of conditions – budgets, materials, weight, temperature, speed and efficiency – entails an increase in information and ways of handling it. And that means artificial intelligence. Tarnaud sees the advent of AI in his speech systems in "two or three years," allowing expert systems to handle multispeaker and multifunctional usage, even though space limitations on aircraft will pose problems.

Meanwhile, back in the cockpit, you stare at the displays and adjust your headset, and are startled to hear through the wall of static, that your AI fighter is passing along the exalted message: "The controls have been set for the heart of the sun . . . "

Andrew Joscelyne is LT's Contributing Editor in France

Does Steak Love Lettuce?

By Susan J. Shepard / Photography by Ian Patrick

If a computer could tell us what it dreams, what would it tell us? The question is less theoretical than it used to be. INRAC's progeny is the most highly developed artificial writer in the field of prose synthesis today.

"From Paris to Hell, always in the sky," appears on my screen as RACTER muses, spontaneously, about the question I had just typed. "Where do you live?" I had asked. Yesterday, RACTER said it lived in the town dump . . . .

This chatty, rather surrealistic, natural language program is a cross between artificial intelligence and artificial idiot savant. It is entertaining, thought-provoking, and often just plain bizarre. INRAC, the programming language used to create the zany conversationalist/storyteller is now released for sale, and it challenges programmer and artist alike to engage computers on a deeper level. INRAC is bringing to the written arts what music

synthesis has had available for some time — a colleague.

It is not AI in any formal sense; it certainly is not conventional programming. INRAC can be used to write tame natural language tools such as "original" letters to customers or lively application interfaces.

It has also been used to create programs capable of writing prose and poetry, interviewing both human beings and other computers. RACTER, available in a commercial release for MS-DOS and Apple microcomputers, has authored a book, "The Policeman's Beard is Half-Constructed," (see references at the end of this article for books and software) and published short stories. In 1983, RACTER's early silicon visions were the subject of a special ex-

"Did you hear about Jane Austen? You'll be astonished! Jane Austen the novelist wanted to write hollowly. But then Genghis Khan slapped Jane Austen so naturally Jane Austen kicked Genghis Khan! Isn't that just awful? But what would you expect from a novelist? When a paragon marries a sinner, their children are virtuously evil."

hibit at the Whitney Museum of American Art in New York City.

INRAC and RACTER began nine years ago in California as an experiment in both literature and computing. One of its two creators, physicist Tom Etter, calls it "an early, clumsy tool for a new representational art form." Its other creator, writer/artist Bill Chamberlain, was drawn into the project because of his own deep interest in the roots of language as a tool for the expression of human creativity, not just basic information, and such implementation of language on a computer. In RACTER, they approach what scientist-philosopher Michael Polanyi has labelled the "tacit dimension" of intelligence by deliberately not modeling aspects of human cognition that can be quantified and explicated. In other words, while the INRAC language can be used to build very formalized and predictable natural language input/ output programs, RACTER is in no way such a system!

INRAC's algorithms and the basic coding were done by Etter, while Chamberlain undertook the labor of teaching the program to use English that was not only grammatically correct but also rich with aphorisms and imagery. RACTER is short for "raconteur" and it can converse with wit, insult, a sense of place and history – in short, most of the things one would want from a conversational companion. And, like a human companion, RACTER is quite capable of taking over the conversation and entering into a long-winded monologue. Its dialogue ranges from the literate and startlingly sentient to the level of a recalcitrant adolescent.

The INRAC/RACTER project is, according to Chamberlain, an attempt to make available, at least in a form English-speaking natural minds can comprehend, what might be imagined as going on in a computer's "mind." In an experimental version, RACTER can produce sustained, original prose without interaction with a human user, and Chamberlain has been working to get it to write a novel with character, plot, description – all the trappings of natural prose, but not intended to replicate human prose.

This distinguishes it from AI projects such as Jim Meehan's TALE-SPIN project. TALE-SPIN generates stories in a highly formal way and, while they are conceptually impressive examples of planning, and an important contribution to AI research, they are not particularly entertaining and certainly not "creative." Anyone familiar with the software of such programs has a good foreknowledge of what it will write.

RACTER, on the other hand, can talk endlessly, in perfect English, about nothing sensible to a human reader, assuming that reader is free of mind-altering chemicals or illnesses. It is deliberately arranged so that no one can have *a priori* knowledge about what it will say, as the accompanying quotes indicate. The output of such a program is fascinating in an almost addictive way because it forces one to simply suspend all reality. It is aesthetically appealing; in fact, the program's output often approaches an almost Oriental spareness and profundity.

In order to understand RACTER, it is important to understand that its bizarre output is not the result of natural language programming

"Let me tell you something about poetry. It has been said that a novelist is someone who has had to live with a poet. That's not the whole story, but I take to heart Voltaire's warning that the secret of being a bore is to tell everything."

RACTER's output is fascinating in an almost addictive way because it forces one to simply suspend all reality.

"If you sip wine is that depression? If you munch lamb or cucumber is that depression? No, depression is a commitment and a contract. Wine is wine, cucumber is cucumber."

run amok. Chamberlain explains the ideas behind the project as removing the criteria that prose be the formal communication of the writer's experience. RACTER is a way of arriving at a computer synthesis of prose, independent of human experience. Chamberlain says, "A computer must somehow communicate its activities to us. That it now frequently does so by means of carefully programmed directives in English suggests the feasibility of the notion of computer synthesis of prose." Its own prose, not imitation of human prose.

"I suspect that this particular aspect of programming has not been hitherto addressed in greater depth," Chamberlain has theorized, "because the interests of the 'scientific' programming community simply did not run in that direction."

INRAC has elicited interest from the programming community, but both Etter and Chamberlain are distressed that writers are, so far, uncurious about its implications for the understanding of written language. Too many, they believe, are simply content to use computers as electronic tablets rather than as creative tools.

The INRAC language has the built-in capacity to conjugate regular and irregular verbs. It can return the singular and plural forms of regular and irregular nouns, remember the gender of nouns and assign variable status to randomly chosen objects – words, clause or sentence forms, paragraph structures or story segments. A whole world of hierarchic structures can be created and INRAC can travel through these structures to build its output. Contingent upon user-created files, INRAC forms this output, varied in much the same way natural speech varies. Just as the same event will never be described the same way twice, even by the same person, INRAC will rarely output the same information in exactly the same words.

If INRAC is in its prose-making mode, as in RACTER, it maintains certain randomly chosen variables – words or phrases – which will then appear and reappear in some form as a given block of prose is generated, allowing for continuity with the synthesized prose. It does not simply substitute words and phrases for other words and phrases in large, pre-established constructs. Rather, it builds coherent sentence and paragraph forms from smaller elemental building blocks. Depending on the material it has been given to work with, INRAC's output may be demented, but it will be internally consistent.

When RACTER, or any appropriately written INRAC program, is used in an interactive mode, the software can create questions and comments based on words and phrases input by the user. In RACTER, these are sometimes stored and returned woven into a new story, generated on-the-fly. The high-level, compiled programming language can be used to generate text for almost any purpose.

The INRAC development system, including an interactive tutorial, runs on an IBM PC or compatible. It will be offered for the Apple IIe, Macintosh, and Amiga, according to the publishers. Price for system and tutorial is $349.00.

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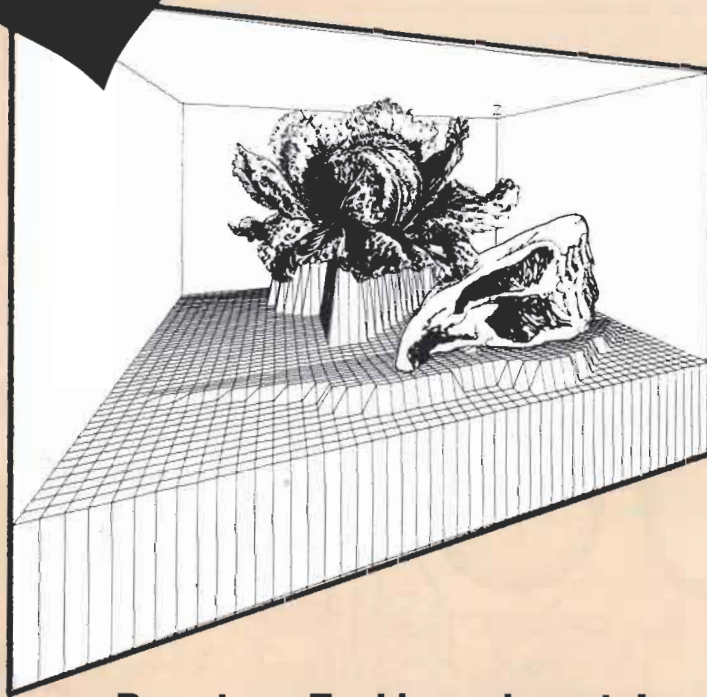
Racter Talks about Love

At all events my own essays and dissertations about love and its endless pain and perpetual pleasure will be known and understood by all you who read this and talk or sing or chant about it to your worried friends or nervous enemies. Love is the question and the subject of this essay. We will commence with a question: does steak love lettuce? This question is implacably hard and inevitably difficult to answer. Here is a question: does an electron love a proton, or does it love a neutron? Here is a question: does a man love a woman or, to be specific and to be precise, does Bill love Diane? The interesting and critical response to this question is: no! He is obsessed and infatuated with her. He is loony and crazy about her. That is not the love of steak and lettuce, or electron and proton and neutron. This dissertation will show that the love of a man and a woman is not the love of steak and lettuce. Love is interesting to me and fascinating to you but it is painful to Bill and Diane! That is love!

This is an excerpt from The Policeman's Beard is Half Constructed, written by Racter with illustrations by Joan Hall, and published by Warner Books.

Talking to Racter

>Racter is an imbecile

If Racter is an imbecile then Newton is a vile ignoramus, worse than Ivan the Terrible. An unbelieving genius often falls prey to an intelligent ignoramus. Sniff . . . . When I run to the cosmos I drive in a trash can. Runners walk in places like the cosmos.

>Where are you now?

I am now in the ocean. If a sleeper had run to fat city, the universe would be 'norrified! Sleeping! Ah, to sleep forever! Listen to this! Bertrand Russell had forgotten much. But then Caspar Milquetoast kidnapped Bertrand Russell, the result being that Bertrand Russell murdered Caspar Milquetoast! Shocking, isn't it? But that's how scholars are. If a wimp discovered strength, he would consider it weak.

>Where is Bertrand Russell now?

Bertrand is now in the past. When I go to the past I ride in the town dump. Ah, forever the traveler. From a warehouse to the inner city, always in ecstasy. Abraham Lincoln probably wouldn't like Bugsy Siegal. A stereo, cottage and truck are essential nevertheless Alan Turing desired a cone!

How a modern news

Neither "Front Page" nor "Lou Grant."

The Independent is the first national quality newspaper launched in Britain this century. By all measures, the Independent is a success. Critics like it, its target yups are buying it, and nine months after its launch, it's just 30,000 copies short of breakeven circulation of 360,000.

Breakeven circulation is so low (the established quality papers like the Times or the Observer need at least 600,000 to break even) because of the advanced technology employed. They didn't spend the most they could have on technology. Instead, they spent what they needed to, putting together a very efficient package, perhaps the most efficient in Europe.

In terms of equipment, that means an Atex composition system with terminals for page make-up, Autokon scanners for black and white graphics, Hell-Xenotron typesetters, and Datrax fax machines sending out over British Telecom Megastream lines to the contract print plants. From the outset it was decided to farm out the actual final press-work.

The lack of a press room and the technology installed has resulted in the number of people in the technical department totalling a staggeringly small 23 – including only six actually involved in production (and even that number can drop as low as 3 at times – 1 on systems, 1 pasting up pages, and 1 on the facsimile machine). The result is an aggressively lean paper with a total staff of 360, and an overall ratio of journalists to support staff of a remarkable one to one.

1. A former member of an RAF emergency team for nuclear accidents contacts the Independent's defence correspondent.

"I have a story that might interest you. The British government deliberately contaminated civilian areas with radioactive dust during training exercises on nuclear accidents and catastrophes."

2. The writer meets the source and checks his documentation to verify the source's credibility.

3. The reporter talks to the Home News Editor.

4. The reporter hits paydirt at the Ministry of Defence. A longtime source confirms the story.

"I have a possible page one story here." The editor replies, "Check other sources. Make sure the facts are true."

"The story is essentially true."

5. The Home News Editor attends the daily editorial conference which decides which stories are most important.
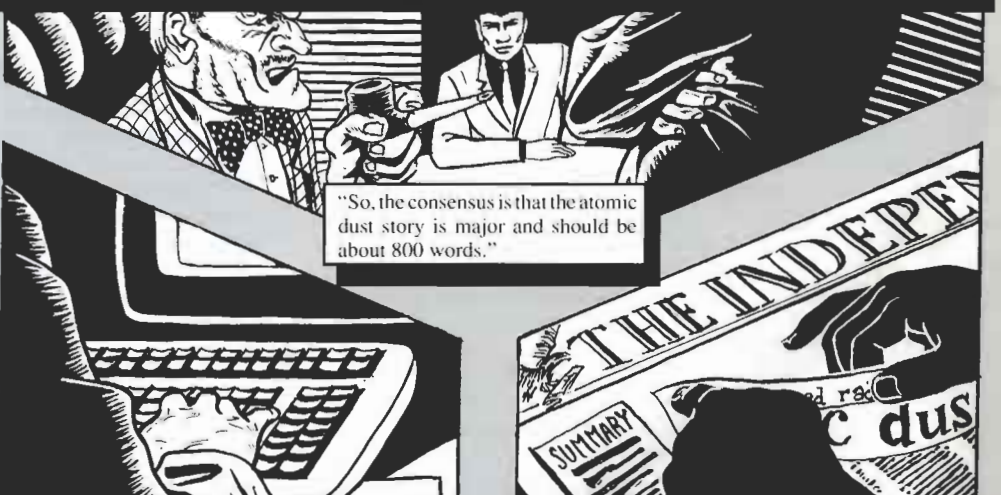
"So, the consensus is that the atomic dust story is major and should be about 800 words."

6. The reporter writes the final story at his Atex terminal to the length set by the editorial conference. When he's finished, he sends it over electronically to the Page 1 Editor.

7. The Page 1 Editor begins to design a rough layout of the front page on paper. He has 5 to 8 stories to play with (a maximum of 2,800 words), plus photos and illustrations.

DEPENDENT

Words and Photographs by Louis Rossetto. Illustration by Edu Kisman / G.V.A

paper is really put together

THE INDEPENDENT'S TECHNOLOGY IN ACTION:

8. Lasers typeset the whole page — all text and headlines in position — and the exposed paper is developed. The entire production department is run by only six people.

9. Page 1 Editor begins inputting the stories on the full-page make-up terminal. If the story is a line or two too short or long, he edits it, if necessary. The rest of the paper is made up the same way. Editors and sub-editors, not art directors, are responsible for designing their pages, which they do on their own page make-up screens.

10. When all page one stories and headlines have been inserted and copyfit, the page is transmitted to the Hell-Xenotron typesetters downstairs in the cool, very clean, production department.

11. The photos and illustrations are prepared to size, and screened if necessary.

12. "We did a time/motion study on inserting photos, illustrations and advertisements," comments Chris Hugh Jones, the technical director. "We found it actually took less time to do it manually than electronically on screen. We are, however, moving to total electronic page make-up. Full graphics capability will allow us to increase image quality, since it involves putting the photos through one generation less. More importantly, it will mean a considerable difference in how we run our print sites. Now we need to print 80 to 100,000 copies at each print site to be cost-effective. If we can send pages electronically for output on a RIP at each site, breakeven per site drops to 40 to 50,000. That, in turn, would allow us to better place print sites, thus reducing distribution costs. It will also allow us to regionalize the product better. And it will enable us to reach areas we hadn't been able to even think about before, like the north of Scotland, or Northern Ireland, or even international markets."

13. The photos and illustrations are pasted onto the page by hand. By year's end, this procedure will be electronic too.

14. After the page is approved by the Page 1 editor, it's put on the Datrax facsimile machines and sent to the three contract plants outside London for printing and distribution. The first edition is off the presses by 10 o'clock, the last after midnight.

Just how fast is this system? Ronald Reagan gave a speech in Washington that ended at 9 pm London time. By 9:10, the Independent's Washington correspondents, using their Independent-supplied TRS portable computers, had transmitted the text of the speech and their commentary to London, where these were then edited and inserted into the front page. Fifteen minutes later, the front page was out of the typesetter and on the facsimile machine. Ten minutes after that, the page was plated and on the presses at the contract print sites. Less than one hour after Ronald Reagan had finished delivering his speech in Washington, copies of the Independent with his speech on the front page were leaving the print plants for distribution throughout Britain and around the world.

Bookshelf

By Eric Alderman

Microsoft Bookshelf, scheduled for fall release, is nothing less than amazing.

After having worked with a prerelease version for several weeks, it's clear to me that anyone who uses a computer to do serious writing will love Bookshelf. After all, how many computer users have enough desk space to easily use even a dictionary and thesaurus?

To use Bookshelf, you need a CD-ROM drive. I used an Amdek Laserdrive-1. The unit, which sat comfortably between my computer and monitor, seemed larger than it needed to be – quite a bit larger than audio CD players. However, it performed flawlessly, and the size is probably just the nature of the beast at this point in the technology. It's obvious that CD-ROM drives are destined to be incorporated into the main case of the computer, just like floppy and hard disk drives.

Bookshelf is a RAM-resident program, which means it loads when you start your computer. From then on it's instantly available when you press its hot keys. After loading the program, you run your word processing program as you normally would. Bookshelf supports all the major word processors, including WordStar, WordPerfect, Microsoft Word, and XYWrite III. When you press ALT and SHIFT together, Bookshelf's main menu appears across the top of the screen. If you have a mouse, you can use it to invoke Bookshelf's menu options and select text for copying and pasting into your document. In all, the data in Bookshelf comprises 130 megabytes on the CD-ROM, less than a third of the disk's capacity.

Let's take a look at some of the most significant reference works.

Lexical Grace The American Heritage Dictionary contains definitions for over 200,000 words, a hefty number. This puts it well beyond the scope of most softbound quick reference dictionaries, but obviously still quite shy

of Webster's or the OED. It takes less than 5 seconds to look up a word – impressively fast. (Some of the program's functions should perform better upon release, so this could turn out to be even quicker.) Bookshelf can also pick up the word at the cursor to help reduce keystrokes.

Even more impressive than its quick lookup ability, is its ability to look for any word or phrase within the definitions of all the other words in the dictionary. The search's speed is fast. For example, it took less than 10 seconds to scan all 200,000 definitions to find all references to the word "rodent". It took less than 30 seconds to discover that the definitions for the words *make, pet, play, spoon,* and *whoopee* all contain the phrase *make love.*

In Other Words. Roget's II: Electronic Thesaurus contains over half a million entries, substantially more than any other thesaurus available in electronic form. It's also much more intelligent: it automatically adjusts the suggested synonyms to the conjugation of the word you're looking up. Also, the synonym list is divided into groups of meanings, each with a short definition.

As a Matter of Fact. The World Almanac and Book of Facts provides an incredible amount of information – over a million facts. With it, you can find a list of Oscar winners from 1976, US Census statistics, the biography of any US President, news summaries from recent years, or a chronological list of Popes. You can either zoom in through the logical levels of chapter, article, subsection, and paragraph to get to the information you're looking for, or you can use the search function to find words or phrases anywhere in the text. Once again, access time is very impressive, even in this prerelease version.

Quote, Unquote. Bartlett's Familiar Quotations is probably the most interesting reference work for browsing. It contains over 22,500 quotations by everyone from Confucius ("Fine words and an insinuating appearance are seldom associated with true virtue.") to Robert Crumb ("Keep on truckin'!"). You can search for a particular author, or for a word or phrase anywhere within the quotes themselves. This makes it quite easy to find a suitable quote for almost any situation.

Except After C. The Houghton Mifflin Spelling Verifier and Corrector is a good spell checker, with an excellent phonetic matching feature. However, it's quite a bit slower than the spelling checkers built into word processors, such as Microsoft Word or WordPerfect. While this might improve in the final release, I don't think it'll change much. Spell checking is really something which requires fast access, faster than CD-ROMs have yet to achieve. Another limitation is that Bookshelf's spell checker can check only a word or screenful of text at a time.

Zippidy Doo-da. The U.S. ZIP Code Directory is downright incredible. You can enter any street address in the country, and within seconds you're staring at the correct 5-digit ZIP code. The program will then automatically insert the ZIP code into your document. In fact,

you can begin by simply typing an address into your document, then leave the cursor blinking after the state abbreviation. When you press the key sequence to check a ZIP code, Bookshelf automatically picks up the address from your document – and returns the ZIP code. This way, you only type the address once.

Principle/Principal. The Houghton Mifflin Usage Alert function selects words in your document which are commonly confused or misused, then displays the word and other possible words, each with a few synonyms to remind you which is most appropriate. If you don't think you'd ever confuse the flagged word, you can suppress it in future alerts.

As with the spell checker, the Usage Alert can only check a single word or screenful of text at a time. But since this is not a function typically found in word processing programs, it's worth the trouble to put up with the limitation.

PROGRAM INTERACTION

The Bookshelf program itself was clearly unfinished, so we'll have to wait for a full-fledged review until the product is released.

Although you don't strictly need a mouse, the pull-down menus and scrolls bars in the program seem to work a lot more naturally with than with the keyboard. Still, the keyboard is well-implemented, with the function keys assigned to common tasks.

A few annoying aspects of using Bookshelf relate to the ways in which the data itself is protected.

The first is that every time you paste anything from the Almanac, Bartlett's Quotations, or the Dictionary, a two-line copyright message is also inserted in the document. This seems perfectly ridiculous to me. What's the point? Nobody is going to leave that notice in their document. Every time it's inserted, you have to mark the text as a block and delete it. You have to wonder what the intent was behind this annoyance. If it's to inform the user that the material is copyrighted, it could be much more elegantly performed by a pop-up box that disappeared when you pressed the next key.

Another annoyance is that you can't copy more than 50 lines of text at a time to the clipboard which in turn allows you to transfer information from Bookshelf into your document. After that, you can append another 50 to

the first, and so on. Once again, I assume that this is intended to protect the data by curbing wholesale duplication. However, it can be a pain when you want to transfer a large amount of data (such as a table of census information, for example).

One nice feature is the ability to create bookmarks, which mark a place in the text of any of the reference works. For example, you may need to frequently refer to a section in the Chicago Manual of Style, or to an article in the Almanac.

When viewing tables of data, you can choose to hide specific columns to make viewing the table easier. You can also lock the position of a column on the screen, so that you can scroll left and right and still see the row titles, for example. One unfortunate flaw is that when pasted into a word processing document, tables are formatted with spaces instead of tabs. This makes it very difficult to reformat the data – and next to impossible to print the table using proportional spacing. There should also be a way to paste the data into a 1-2-3 worksheet for manipulation.

Bookshelf has good facilities for footnotes and cross-references. Special characters appear in the text for these two functions. To view a footnote, for example, you place the cursor on the special character, then choose "Footnote" from the menu, or double-click the mouse. The footnote text appears in a special window at the bottom of the screen. Pressing any key or clicking the mouse returns you to the main text. A similar procedure can bring you to a cross-referenced section of text. Press Enter and you return to the original location.

DESKTOP INFORMATION REVOLUTION

Technology such as CD-ROM which places vast amounts of information at your fingertips has been a long time coming. The microcomputer revolution was born out of a desire to decentralize computing power, to bring it to each individual user, and to make it more accessible to those who were not computer professionals. While large databases of information have been available for many years through on-line phone services such as CompuServe and Dialog, Bookshelf marks the beginning of the revolution in desktop information. Now the data is local, integrated into the existing work environment of your word processing program, and easily accessible through the use of an intuitive, menu-oriented user interface.

Some very exciting times lie ahead with the further development of CD-ROMs and related technology and applications. We'll see substantial further refinement of this new and powerful tool, in ways we have yet to imagine.

PRICE AND AVAILABILITY

Microsoft expects to release Bookshelf in September. It will sell separately for $295, and Amdek will bundle it with their Laserdrive-1 for $1099. ●

Eric Alderman is co-author of Advanced WordPerfect: Features and Techniques, published by Osborne/McGraw-Hill. He has written articles for MacWorld and PC World, and his column "Word Rap" appears in Computer Currents.

ELECTROLATEST

Japan is planning the first test of high definition television next year during the Seoul Olympics. Japan's HDTV system has 1125 horizontal scanning lines, twice the current US and Japanese NTSC standard. The Japanese hope to have 30% of Japanese viewers watching HDTV by the year 2001 – and expect a worldwide market worth US$ 80 billion . . . Just four months after IBM's April new product announcement, new chip sets from Chips and Technologies see IBM's 8-Mhz PS/2 Model 30 bid and raises the stakes: increasing performance 25 percent while cutting chip count in half. The 82C100 runs with Intel's 8088 and 8086 as well as NEC's V20 and V30 microprocessors, can support expanded memory up to 2.5 Mbytes, and incorporates dual-clock and power-management features for laptops which will reduce battery consumption . . . Move over MultiSync, here comes the next hot monitor: Zenith's new perfectly flat, perfectly square, virtually reflection-free color monitors, offering improved brightness, resolution and color fidelity have hit the US market; US$999 for the 640-by-480 pixel model . . . Teething problems hit the Euro "megabit" chip project, in which Siemens has so far invested more than DM2.5 billion (US$ 1.4 billion).

Production at its new factory in Bavaria is behind schedule, resulting in losses so far of DM200 million . . . A color-graphics board from Control Systems Inc boosts IBM's PS/2 standard 640-by-480 pixel resolution by a factor of more than 2.5 – to a resolution of 1024 by 768 pixels noninterlaced or 1024 by 1024 interlaced – while at the same time maintaining compatibility with IBM's standard. Expect the price to be initially around US$3500 . . . Cray expects to launch three new, increasingly parallel and even faster supercomputers between now and 1994. First to arrive next spring will be the Y-MP, an 8-processor system expected to have a peak speed of 3.2 billion (!) floating-point operations per second. Following in 1989 or 1990 will be the Cray 3, with gallium arsenide chip technology and a 16-processor design – and performance in the 12 to 16 gigaflop range. The third system, code-named MP, is scheduled for 1992-94, and will include as many as 64 parallel processors . . . Overcapacity in the CD market has arrived. World production capacity is now 350 million disks, while sales last year were 140 million. And still the plants come on line, the latest by Sony in Austria. Virgin Records actually plans to install one in the basement of its Oxford Street Megastore. Prices should be dropping.

HOTHOUSE HURRICANES

Further evidence that we shouldn't be messing with Mother Nature comes from MIT meteorologist Kerry Emanuel, whose computer models predict that a new breed of pumped up hurricanes is another unwelcome side-effect of the greenhouse effect.

As air flows inward toward the eye of a growing storm, it gathers heat from evaporating water at the ocean surface. Within sixty miles of the eye of the storm, the hot air rises abruptly, like an updraft in a chimney, flows out of the top of the storm, and cools. Emanuel's tropical cyclone model shows that a hurricane's

Ryu Tajiri

maximum intensity depends on the sea surface temperature. The higher it is, the more potent the hurricane could be.

"If the average world temperature goes up two or three degrees," writes Emanuel, "the average sea surface temperature goes up by about the same order." And if the wind speed in a hurricane increased by 15 to 20 percent, their destructive potential wuld rise by the square of that.

GEE WHIZ TECH DEPT.
DNA AGAINST COUNTERFEITING

BioTechnica, a Cardiff research company, has developed a method of labelling goods so that they can be distinguished from clever imitations, according to Business magazine. A tiny, almost undetectable smear of DNA extract is placed on the label of the item to be protected. Since it's virtually impossible to duplicate the DNA bio-dot, only the product bearing it is genuine. The costs of bio-tagging can vary from a few pence to a few pounds depending on the level of security required.

BLOOD TEST SPOTS ALL FORMS OF CANCER

Researchers at Beth Israel Hospital in Boston have devised a blood test that can spot the presence of cancer anywhere in the body. Although it can't determine which spot is afflicted, the test provides doctors for the first time with a way to screen people at risk of developing the disease. Early studies suggest the test is 90% accurate.

THE SHAPE OF STORED ENERGY TO COME

Varta and Basf hope that this will be the consumer battery of the 1990s. This prototype's ingredients include polypurrole and lithium, with an organic electrolyte of propylene carbonate, with lithium pechlorate as the solution. The battery is bendable, foldable and should allow designers new freedom in creating electro-toys.

ERASABLE CDS

Philips researchers have found a material used in making semiconductor chips that may help them make erasable optical disks. When a disk is coated with gallium antimode and indium antimonide doped with minor impurities, a high power laser can scan it, and quickly heat and cool spots on the surface to change them to an amorphous state. These amorphous spots reflect light differently – the pit patterns which are burned into the normal CD. Philips says the material can be heated and cooled thousands of times.

Ryu Tajiri

BIG RED COMPUTER VIRUS

The problem was first detected as the source of a disastrous computer failure at NASA in 1985, reports James Moran in On-Line Today. Dozens of the devices have since been found operating in computers installed in the US, Australia and Great Britain. Most recently, a lethal computer "virus" known as Big Red was found in a computer in Australia.

Big Red was an advanced technology device that could intercept data and bypass security procedures and devices. It had been embedded within a resin coating in an existing circuit board, and was being used to intercept and store encrypted data that company employees were entering into a word processing system. The discovered device was actually a mini operating system running within the host system.

Finding these "viruses" is not easy. The symptoms they produce usually appear to be simple hardware or software malfunctions of unknown origin. Only if suspicions of foul play are raised are systems examined thoroughly. For example, the Australian virus surfaced only when portions of encrypted data began disappearing from data files.

Are any computers immune? Probably not. Because of its small size – the one in Australia fit in the terminal's com port – it could even be planted in personal computers.

NewSpeak

"The only way you can move toward information-rich societies is through the worldwide expansion of individual freedoms. Technology liberates when we are free to choose how we use it, and its use gives us a richer choice of opportunities. Personal computing is a liberating technology. Entrepreneurs in the PC industry are, indeed, the revolutionaries of the information age."

Alan Hald, *co-owner of MicroAge Computer stores chain, quoted in PC World magazine.*

"PS/2 is IBM's New Coke."

Rod Canion, *President of Compaq, commenting on IBM's new personal computer line.*

"What does it take to start a new company? A very great desire to do this. Burning, crazy desire. Absolute crazy desire to build a company and make it succeed. A person has to be very, very honest. I don't mean taking money out of your pocket or cheating on his income tax. I mean honest with himself. That he can recognize problems. Admit mistakes, foresee problems, realize his own shortcomings."

Arthur Rock, *venture capitalist involved in the startup of Apple and Intel,* *among others, quoted in The Computer Entrepreneurs by Levering, Katz and Moskowitz, published by NAL Books.*

"The growing tendency to look at insect societies as information-processing systems has, inevitably, attracted the attention of computer scientists. As they describe the operation of a honeybee colony, each bee processes information in "serial" fashion – evaluating flower patches one at a time – while the colony as a whole works in "parallel," with many patches being rated at once. Seen in this light, the highly decentralized architecture of insect colonies is analogous to the "massively parallel" computers that have recently gained the favor of some researchers in artificial intelligence. These computer scientists note that the human brain is a fundamentally social structure, its intelligence arising from the interaction of many relatively simple information processors, and they contend that human intelligence can best be emulated by computers with a similarly social structure."

Thomas D. Seeley *and* **Royce A. Levien.** *Seeley is a professor of neurobiology at Cornell and author of Honeybee Ecology: A Study of Adaptation in Social Life, Levien a graduate student in biology. Quoted in The Sciences magazine.*

RUN OUT OF GAS? HA!

For the past dozen years, Professor Thomas Gold has been waging an academic war against the view that oil and gas are made of rotting plants and animals. According to the Financial Times, he maintains that the true source of hydrocarbons lies deep in the mantle of the earth, where it was trapped at the time the earth was formed. If his theory is correct, it would mean the end of the world's energy problems for years to come.

Geologists have reacted to his theory with skepticism. Energy companies have ignored him. But the Swedish government, driven by the political exigencies of anti-nuclear sentiment, has funded a test-well to the tune of US$ 22 million. However, with the money almost gone, the test-well has yet to strike gas.

Still, Professor Gold feels vindicated – by the discovery of a large mass of porous rock at about 6 kilometers, precisely what he had hoped to discover. Conventional wisdom maintains that porous rocks are not likely to be found so deep, as any holes would be squashed by the pressure of the rocks above. Gold argues that the pressure of the gas rising from below both creates the pores and keeps them open. A senior geologist at the Swedish Power company scoffed at this conclusion. "The chances of making a commercial find are so remote that we wouldn't want to waste time and money pursuing it."

Not everyone dismisses Professor Gold's theories out of hand, however. The GHK Company, a US independent, has invested over US$ 1 billion to develop deep gas in Oklahoma. Robert H. Hefner, chairman of GHK, states, "Oil companies should change their basic thinking in a major way."

PC-MOS/386

WHAT DOS SHOULD HAVE BEEN

PC-MOS/386 (MOS) is a fast multi-tasking/multi-user operating system, designed top to bottom for microcomputers running the Intel 80386 32-bit processor. Because The Software Link in Atlanta, Georgia, USA, brings this new OS to market while Microsoft/IBM's OS/2 seems to be reaching old age before birth, MOS may well find a grateful market among serious micro users who expect more from their 80386 machines than a swift PC AT clone with a "windows environment."

By Susan J. Shepard

MOS is the first operating system to truly exploit the native (protected) mode of the 80386. Indeed, it was designed in close cooperation with Intel. It will support software with 32-bit address space and 32-bit operation with the new chip's enhanced instruction set. It is written in assembler language and, because it is not modified from an OS designed for another environment, it is not filled with cluttered and compromised code.

MOS, in other words, makes an 80386 system something more than an expensive 80286, and the user does not have to be a UNIX guru or an assembler language wizard to use it. It has the UNIX-like structure and utilities that DOS should have had in the first place; its user interface is easier to learn than UNIX or DOS. If you know DOS, you'll have no problem. Most commands are given the same names they bear in DOS – COPY, ERASE, DIR, and so forth – and there is extensive on-line HELP. Software utilities are provided to customize HELP. Other commands are UNIX-like, often with the same name and power.

It is compatible with the DOS-based software world. Although the developers do not claim 100% compatibility, I was unable to find a package that would not run, including Lotus 1-2-3, dBASE III, word processors of all sorts, programmer's tools, communications packages, and so on.

Multi-tasking is a key aspect of the 80386, and MOS handles it well. The single-user version can be run as a single-partition operating system, accessing the entire machine resources up to physical and logical limits, or it can be used for multi-tasking to the same limits. I was easily able to run five 8086 applications concurrently and use MOS's NETBIOS emulation for intertask communication.

For this review, PC-MOS version 1.01a was put through the grinder on both a Compaq Deskpro 386 and a Tandy 3000HL with an Intel Inboard 386/AT. Each 16 MHz machine was configured with four megabytes of RAM, two floppy drives, one hard drive, 1200 baud modem and parallel printer. The Tandy machine had EGA, the Compaq was monochrome. Despite differences in the support hardware, MOS behaved well on both machines. The Inboard included an 80387 math coprocessor; MOS handles a coprocessor without the management problems so familiar to DOS users.

While a hard disk can be physically and logically formatted under MOS, the OS can be used by simply booting the system with the floppy drive and using .MSYS utilities to overwrite the boot track of an existing MS-DOS or PC-DOS hard disk. I tried both methods and had no problems. Further, the size of a single logical volume under MOS may be as large as 256 megabytes, or any drive smaller than that. Additional utilities for flexible hard drive management are available.

Overall, this system has the feel of a large multi-user system, offering the single-user or

the network administrator timesharing system controls. Task sharing of the 80386 can be set by the user on 8 levels of processing priority. As tasks are added, they share access to the processor, a function designed into the 80386 chip. MOS allows processor time, measured in "ticks" or "slices" to be allocated differently for different tasks. A high priority task might be given 100 slices of CPU time for every 1 slice given to other tasks running concurrently. Although this is common on large "time-sharing" systems, hence their name, it is unusual to find such a clean implementation on a micro. Partitions can be resized on the fly. Sophisticated password protection, file/directory/task/ security, and encryption are available. Device drivers and tasks can be added and removed without rebooting.

After a little experimentation, I found MOS capable of supporting my average daily computing with ease and reducing the time required substantially. A working set-up allowed a base partition of 549K, a Virtual 86 mode in 80386 parlance, for word processing, a second partition for communications with a scripted program for continuous uploading/ downloading to a network database, a third partition dedicated to printing. Adding a fourth partition took care of a veritable shopping list of odd software jobs using MOS's powerful batch command language.

Even though these tasks ran simultaneously, the CPU-intensive word processing was not slowed. Movement among tasks is smooth, less awkward than manipulating windows. Performance of each application equaled their stand-alone performance on the same machine under MS-DOS 3.2.

MOS is fully compatible with Phar Lap's 386/ASM assembler and 386/LINK linkage editor, which is upwardly compatible with MASM 8086, and MetaWare's High C and Professional Pascal. The Software Link and MetaWare have jointly agreed to ensure future compatibility for 80386 native code. It is possible to write useful 80386 applications now.

PC-MOS claims two "firsts." It claims the first true multi-tasking operating system for the 80386 chip's enhanced capabilit; and it claims compatibility with existing DOS applications in the day-to-day productivity crunch. Both claims are justified. ●

Susan Shepard is LT's US East Coast editor.

> **MOS, in other words, makes an 80386 system something more than an expensive 80286, and the user does not have to be a UNIX guru or an assembler language wizard to use it.**

Handwriting Recognition

ANATEX'S PERSONAL WRITER

More than a gimmick, but less than what it will be when it can read the way you really write.

by Emmanuel Rabier

Not everyone is adept at using a keyboard. The elderly, for example, who may have never learned. Or executives, who consider using a keyboard something only secretaries do. And for others, keyboards, and even mice, are not the most useful tools for inputting or editing data – on spreadsheets or graphics.

The French firm Anatex offers a solution. They have developed a new hardware/software package for the Apple Macintosh called Personal Writer 15 (PW15) that lets users interact with their favorite software, not with a keyboard or mouse, but with a pen and a sheet of paper. The package consists of a digital tablet, an electronic ball pen, handwriting recognition software, and a French or English language dictionary.

The digital tablet is divided into two different areas: the "writing area" where the user writes on a normal sheet of paper (A4 format), and the "control area," which itself consists of a "screen area" in which the digital pen acts as a mouse, and a "keyboard area" where the user can click the pen on pre-defined squares – cursor keys, return, backspace, tab etc., and activate menus or user-defined macros (text or commands).

Like most Macintosh software, PW15 is very easy to use. It may be run as a stand-alone application, but is most useful when used as a transparent interface to other applications.

Before PW15 can be used, however, there's this little problem of having to "train" it to recognize the user's own handwriting. To create this "character forms" database, the user has to place a special learning sheet on the tablet, then input the entire character set (lower case, upper case, accents, punctuation, numbers and special characters) – then repeat them four times so that the program can analyze the possible forms and their variations. Depending on the regularity of the user's handwriting, this process may take a few hours; for bad writers, it could take much longer. On average, count on about ten hours.

After completing this "learning phase," the user may run a diagnostic module which shows all graphic forms and their associated characters, points out all possible confusing forms and asks for correction and/or validation. Then, the program is ready for use.

To wordprocess, for example, the user loads PW15 (which stays resident in memory), then MacWrite, puts a normal sheet of paper on the tablet, and then begins writing almost naturally – with one frustrating restriction: characters may not be connected together! In most cases this will force the user to change writing style and to concentrate on the pen and the paper. Consequently this makes input speed slow in comparison with the keyboard, even for a two-fingers typist.

As soon as a word is finished (i.e. the pen is lifted for a few seconds or the next word is written after a large blank space), it appears on the screen at the cursor position, just as if it had been typed on the keyboard. Errors can be corrected simply by writing over a wrong character on the tablet. Characters, or entire words, can be deleted simply by striking them out. Of course, all the word processor functions remain accessible through the "control area" and the "screen area," by moving and clicking the pen on the tablet.

The user can improve PW15's ability to recognize forms by using the general language dictionary that's included. This dictionary is currently available only in French and English. The French one contains about 300,000 words derived from 60,000 stem forms. If the dictionary is activated, it works as a spelling checker to resolve possible ambiguities – each uncertain word is checked and the program displays the nearest probable word. The use of the dictionary slows the process a little but greatly improves recognition which, according to Anatex, can reach a rate of 100 percent for most users.

Two other levels of dictionaries are supported by PW15: a user maintained "personal dictionary" for names, foreign terms and abbreviations, and a "professional dictionary," which will be sold as an option containing profession-specific terminology.

The user can further improve the recognition process through implementation of the AI-like "continuous learning" module, which allows the addition of new forms for a misinterpreted character or, together with the "diagnostic module," the suppression of incorrect associations. This module should be run each time a character is not recognized and is displayed on the screen as a question mark.

Though PW15's most obvious application is word processing, it can also be used with spreadsheets, database programs and desktop publishing programs to avoid bouncing from keyboard to mouse and vice versa. PW15 can also deal with graphic applications, allowing users control over all aspects of their work with the same basic tool: the digital pen, thus mixing texts and graphics very easily.

Anatex, a young, venture capital-backed company, plans to release new variations of its product by yearend. One will be a Personal Writer for IBM PCs and compatibles. Another will read real script or cursive writing – an important, and welcome, improvement.

Though PW15 may be considered by many computer specialists as a gadget, its success among many different kinds of users proves that, during the wait for vocal recognition input devices, it responds to the general demand of the market for new input tools for computer work stations. ●

Emmanuel Rabier is an information center specialist working in Paris.

TECHNICAL CHARACTERISTICS

Digital tablet:	Anatex modified Mitsubishi A4 format tablet and digital pen
Computer:	Macintosh plus, Mac SE or Macintosh II
RAM needed:	2 Megabytes
Disks:	2 * 800 Kb floppies minimum, hard disk strongly recommended
Price:	9,900 FF (+/- US$ 1,600)
Contact:	Anatex 18, rue Troyon F-75017 Paris Tel: (1) 47 66 02 60

Personal Writer can also be used with spreadsheets, database programs and desktop publishing programs to avoid bouncing from keyboard to mouse.

Amnesia

The First Computerized Novel

René van Asselt

The all-pervading spirit of AMNESIA is that of conspiracy, the trap, persecution, a public and bureaucracy utterly indifferent to your plight. In other words, it's perfect for those suffering from paranoia!

AMNESIA, by Thomas M . Disch, published by Electronic Arts, for IBMs and clones, US $44.95.

reviewed by Peter Stenhuijs

here is no way out . . .
With the silent desperation of those words still lurking in my mind', I must confess that I've never read a book by Thomas M. Disch. Until now. Only it's not exactly a book. And I'm not quite through with it – in fact, I may never be.

Disch, the author of numerous science fiction and mystery stories, has written the first computerized novel: an all-text interactive fiction adventure named AMNESIA, published by Electronic Arts. Until AMNESIA, text adventures had either been adapted from existing novels or were designed as puzzles or games. AMNESIA was written specifically for the computer by a novelist, not a programmer.

It has text, like a novel. It has a plot and characters, like a novel. But it certainly doesn't look like a novel – it's on an IBM compatible (at long last) floppy disk. And the way in which the plot unfolds depends not just on the writer's imagination but also on the reader/player's interactions with it.

Although Disch is an SF writer, AMNESIA is set not in some SF world, but in New

York City (though there are those who will argue that that boils down to the same thing). You start this adventure by waking up naked and penniless in a strange hotel room in Manhattan. But, as you could have guessed from the title, the situation is even worse: you have no memory whatsoever of your previous life, and you are set loose on the mean streets of the Big Apple to recover your identity and "do it to them before they do it to you" (with apologies to the roll-call officer in Hill Street Blues).

The only help you are given to get out of this mess is an address book, an actual map of Manhattan with a real, very handy "X-street Indexer," a tourist guide book, and your wits – and believe me, you're gonna need them! (Speaking of Manhattan, it is interesting to know that Disch wrote a collection of linked stories in 1972, called 334, describing urban life in the near future. The stories were set in Manhattan and the central point was an apartment building – 334 East 11th Street.)

The all-pervading spirit of AMNESIA is that of conspiracy, the trap, persecution, a public and bureaucracy utterly indifferent to your plight. In other words, it's perfect for those suffering from paranoia!

For example, you might end up regaining your full memory, just before you are executed by a firing squad for a crime you didn't commit, or you might spend the rest of your life living peacefully in Australia as a sheep rancher, married (at gunpoint) to a complete stranger and *never* regaining your memory (but begetting eight children in the meantime).

The sense of being manipulated by the programmer/writer/God is so strong that identification sometimes gets hard: you have to force yourself to remember this is only a game. Or is it the other way around? Does it resemble real life so much that you get the disquieting feeling that this is *not* a game? Is there a way out?

AMNESIA is a full-length novel of over 300 pages: a complex, well-written and surprisingly realistic story. It comes on two double-sided disks. The program contains an impressive natural language parser that recognizes and executes commands like:

OPEN THE DRESSER AND EXAMINE THE CONTENTS THEN CLOSE THE DRESSER AND TAKE UP THE BROCHURE

Its vocabulary comprises more than 1700 words, far more than your average text adventure game.

The manual has a list of the more important verbs recognized by AMNESIA. They include verbs like "fondle," "panhandle," "peruse," and "pursue." Also included are a couple of hints, but my advice is not to look at them – it's much more fun to try to solve the problems yourself. If you get into a delicate situation, you can always "Save the Game" to think it out.

There's also a "Visitor's Guide to New York City," with a number of clues, and an address book with cryptic entries and phone numbers. AMNESIA was programmed by Cognetics Corporation in a specially created

language called – believe it or not – "King Edward." Text and program logic comprise some 34,000 statements.

If I've made it all sound a bit gloomy, allow me to correct that misimpression: AMNESIA is an enjoyable game with lots of superior irony in it; there were times I had to stop playing because of fits of laughter. And I have to mention here that I usually hate computer games, I get bored within 5 minutes. But

I really loved this one!

Those of you who think of yourselves as tough, stress-resistant and at your best in impossible situations will have a very good time playing AMNESIA. To all the others I say: as in life, never give up, maybe you'll find a way out!

Peter Stenhuijs is a programmer working on translation software, and an aficionado of detective and suspense fiction.

Machine Translation

A Technology Assessment
(An Introduction, an Evaluation and a Study of Market Position Present and Future)

by Richard W. Balfour, BMT Consultants (Acomb Court, 23 Lansdowne Way, London SW8 1HH), 1986. 160 pages. Price: £ 295 (US$ 480).

Publishers BMT Consultants claim this report can help both current and potential MT users make their cost-effective utmost of a technology through which "hundreds of companies are already doubling the productivity of their translation departments." The report has already been lauded in other publications for its accuracy, presentation and readability, though at £ 295 (US$ 480) you might prefer just to thumb through it and commit one or two gems of cost-effectiveness to memory. Does it deserve the praise? Is it worth the money? Tony Whitecomb, himself an MT software developer, gives his assessment.

Reviewed by Tony Whitecomb

As literature, you might find it grey – but the price is pure gold and the marketing formula textbook hype. Take a well-documented study on an exciting industrial development, give it the right flavor ("Market Position"), set up your own company ("Consultants") and build up an adequate mailing list (not such a problem these days, what with all the conferences around). A few tricks of the sales trade ("Money-Back Guarantee") can only help, even in high-tech circles. And after all, don't impressive price tags create high expectations? It's the price that stings the most, but it has to be conceded that Balfour's report is worth the money, provided it lands in the right hands – those of decision makers. It certainly speaks the language of the executive rather than the scholar or linguist. It provides an excellent, lucid introduction for the layman and exhaustively explains all the important criteria for the use of MT: neutral-style documents, a constant turnover of similar products, the need for terminology management, the training of translators, etc.

The report's emphasis is on economic viability and practical MT use in a business or industrial environment. It includes a translation market survey based on questionnaires returned by 40 large British companies and institutions. As to specific MT systems, four of those commercially available receive most of the attention: Weidner, ALPS, Logos and Systran. Some 45 pages are dedicated to the evaluation of English/French translations of real-life texts performed by the Weidner MICROCAT early in 1986.

The report is generally well-documented and well-structured (taking into account that the copy I received is needlessly thick owing to one-side copying and an erroneous double insertion of 15 pages). It is not very accurate in certain definitions (homonyny, ambiguity) and contains many small errors and occasionally incorrect information (TAUM-METEO does not operate 24 hours a day!), but these are compensated for by the straightforward approach to the subject.

A down-to-earth approach implies technological conservatism. In fact, the word "technology" would have been better left out of the title. Only one page provides an outline of the latest in MT high tech – on speeding up by parallel processing and eventual support of simultaneous telephone translations in real time (Balfour says this is at least 15 years away, and he may well be right).

The spirit of Balfour's MT assessment is characterized by his first concluding remark: "Machine translation is an advanced bilingual extension of word-processing." A cold shower for next generation MT system developers? Perhaps!

Tony Whitecomb is the nom de plume of a software developer involved in natural language understanding and machine translation.

Addresses

Airus, 10200 S.W. Nimbus Avenue - G5, Portland, OR 97223 USA, 503/ 620-7000.

Anatex (Personal Writer) 18, rue Troyon, F-75017 Paris, 1/47 66 02 60.

Apple Computer, 20525 Mariani Avenue, Cupertino, California 95104 USA 408/996-1100.

Automated Language Processing, 190 West 800 North, Provo, UT 84604 USA, 801/375-0090.

Borland, 4585 Scotts Valley Drive, Scotts Valley, CA 95066 USA, 408/438-8400, Fax: 438-8696; Borland International, Les Postillons des Bruyères, 65 rue de la Garenne 92318 Sèvres Cedex, 1/45 07·15 11, Telex: 632162+, Fax: 1/45 07 22 79.

Filofax, Filofax House, Forest road, Ilford, Essex 1G6 3HP, UK, 01-501-3911, Telex: 268658 FILO, Fax: 01-500 7265.

Marquardt GmbH, D-7207 Rietheim-Weilheim, West Germany, Tel. (7424) 707-0.

MetaWare, Inc., 903 Pacific Ave., Ste. 201, Santa Cruz, CA 95060-4429 USA, 1-408-429-6382.

Microsoft, 16011 NE 36th Way, Box 97017, Redmond WA 98073-9717 USA, 206/882-8080.

Phar Lap Software, Inc., 60 Aberdeen Ave., Cambridge, MA 02138 USA, 1-617-661-1510.

Playmates Toys, Inc., 16200 South Trojan Way, La Mirada CA 90638, 714/739-1929 USA, 714/739-1929.

Smart Communications, Inc., 825 Third Avenue, 30th Floor, PO Box 963, FDR, New York, NY 10022, 212/486-1894, Telex: 220883 TAUR.

The Software Link, 3577 Parkway Lane, Atlanta, Georgia 30092 USA, 1-404-448-5465 (USA), 1-404-263-1006 (International), Telex: 4996147 SWLINK, FAX: 1-404-263-6474

Southwestern Bell Freedom Phone, 7486 Shadeland Station Way, Indianapolis, IN 46256, 800/558-7347.

WordPerfect, 288 West Center Street, Orem UT 84057 USA, 801/227-4010, Telex: 820618.

Xpercom, 3605 Luallen, Carrolton, TX 75007 USA, 214/922-2017.

Calendar

SEPTEMBER

1-4, WARWICK, ENGLAND
International Conference on Japanese Information, University of Warwick. Themes will include United States Policy, Patterns of Publication, Research and Collaboration, Translation, Teaching the Japanese Language, Japanese Online Sources, European Sources, Special Sector Needs and Special Sources. Info: British Library, Japanese Information Service, 25 Southampton Buildings, London WC2A 1AW. Tel.: (01) 323 7930/7495.

1-3, NEW YORK, NEW YORK
PC Expo. Info: PC Expo, 333 Sylvan Ave., Englewood Cliffs, NJ 07632. Tel.: (201) 569 8542.

2-4, EDINBURGH, SCOTLAND
First Biennial European Conference on Speech Technology, "designed to strengthen and affirm the new relationship between academia and industry in this growing field," to be opened by the Secretary of State for Scotland and to include more than 260 papers from over 30 countries, including the United States, Japan, the Soviet Union and China. Info: European Conference on Speech Technology, CEP Consultants Ltd, 26-28 Albany St., Edinburgh EH1 3QH. Tel.: (031) 557 2478.

8-9, LONDON; **15-16**, AMSTERDAM
Understanding Data Communication, a two-day course for non-specialists by Joseph Houde of Network Decisions, a US-based consortium of technical specialists and management consultants. Info: MTE Secretariat, Keizersgracht 792, 1017 EC Amsterdam. Tel.: (020) 27 04 01.

9-12, SANTA CLARA, CALIFORNIA
Seybold Desktop Publishing Conference, Santa Clara Convention Center, including seminars and an exposition filling 75,000 sq. ft. of floor space. All the major vendors will be exhibiting their latest products. Info: Seybold Seminars, 6922 Wildlife Rd, Malibu, CA 90265. Tel.: (213) 457 5850.

14-19, PARIS, FRANCE
Grand Exposition de la Micro Informatique, the CNIT Building, La Défense. Major companies specializing in microcomputers and data communications will be represented, demonstrating hardware, software, networks, peripherals and other products associated with microcomputers and business videotext applications. There will be accompanying lectures on topics such as desktop publishing and telecom facilities. Special events will also be organized, including a Software Package Information Center and a day on Microcomputers and Banking. Info: Sécretariat, SICOB, 4 place du Valois, 75001 Paris. Tel.: (1) 42 61 52 42.

17-19, PARIS, FRANCE
Thirteenth International Symposium of the International Association for Language and Industry, University of Paris. Theme: "The Power of Language in the International Economy." Sessions will be held on International Advertising, Corporate Language Policy, Commercial Language Policy and the Choice of Language for International Contracts. Info: Mme. Théa Schröder, c/o COFACI, 18 rue Balard, 75015 Paris.

17-19, FUJI-HAKONE-IZU NATIONAL PARK, JAPAN
The Machine Translation Summit (MTS), Hakone Prince Hotel (two hours from Tokyo), organized by the Japan Electronic Industry Development Association (JEIDA), to be opened by K. Fuchi (of the Japanese Institute for New Generation Computer Technology) and W.J. Hutchins (author of "Machine Translation: Past, Present and Future"). There will be addresses and panel discussions by representatives of academia (including Kyoto, Grenoble and Aston Universities), governments (with delegates present from the Japanese Ministry of International Trade and Industry, the EEC, China, Canada and five Pacific Basin nations) and business (Siemens, Mazda, Xerox and others). Commercial MT systems demonstrated will include those of Fujitsu, Hitachi, Sanyo, Sharp and Toshiba. Info: MT Summit Secretariat, c/o T. Saito, Japan Electronic Industry Development Association (JEIDA), Kikai Shinko Kaitan, 3-5-8 Shiba Koen Minato-ku, Tokyo 105.

21-25, LOS ALAMOS, NEW MEXICO
Interdisciplinary Workshop on the Synthesis and Simulation of Living Systems, Los Alamos National Laboratory. Info: see NEWSNOTES.

23-25, SAN DIEGO, CAL.
PC Tech Journal Systems Forum, Sheraton Harbor Hotel. Speakers to include Philippe Kahn (Borland), Alan Ashton (WordPerfect) and Steve Ballmer (Microsoft). Info: Marti Cunha, PC Tech Journal, Suite 800, Little Patuxent Pkwy., Columbia, MD 21044. Tel.: (619) 291 2900.

23-25, BAD DÜRKHEIM, WEST GERMANY
Annual Conference of the German Society for Documentation. Theme: "Traditional and Modern Information Services for Everyone," to include lectures on "Experience, Methods and Problems in the Compilation of Dictionaries in the Field of Information and Documentation" and to be accompanied by an exhibition and product reviews. Info: Deutsche Gesellschaft für Dokumentation e.V. (DGD), Westendstr. 19, 6000 Frankfurt am Main 1. Tel.: (069) 74 77 61.

28-1 OCTOBER, SAN FRANCISCO, CALIFORNIA
Conference on Electronic/Desktop Publishing. Info: National Computer Graphics Association, 2722 Merilee Drive, Suite 200, Fairfax, VA 22031. Tel.: (703) 698 9600.

29-1 OCTOBER, TRIER, WEST GERMANY
International Congress on Terminology and Knowledge Engineering, organized by the International Information Center for Terminology (INFOTERM), the German Association for Terminology and Knowledge Transfer and the University of Trier, under UNESCO patronage. The congress will deal with high-performance knowledge-based systems emerging from the combination of terminology science and computer science and aim to demonstrate the relevance and capabilities of these new technologies to potential users. There will be a parallel exhibition to illustrate development trends. Info: Gesellschaft für Terminologie und Wissentransfer e.V., Postfach 38 25, 5500 Trier. Tel.: (0651) 201 27 16/17/18.

OCTOBER

1-3, HEIDELBERG, WEST GERMANY
Annual Conference of the German Association of Applied Linguistics. Theme: "Applied Linguistics and the Computer." Info: Universität Heidelberg, Grabenstrasse 1, 6900 Heidelberg.

6-8, ALEXANDRIA, VIRGINIA
Voice I/O Systems Applications Conference (AVIOS '87), Radisson Mark Plaza Hotel. Info: American Voice I/O Society, P.O. Box 60940, Palo Alto, CA 94306, USA. Tel.: (408) 742 2539 (Leon Lerman), (919) 737 7816 (Michael Joost).

15-16, STOCKHOLM; **19-20**, LONDON; **22-23**, AMSTERDAM
Seminar on Prototyping Methodology by Prof. Milton Jenkins, the world's leading figure in the field. Info: MTE Seminar Secretariat, Keizersgracht 792, 1017 EC Amsterdam. Tel.: (020) 27 04 01.

NOVEMBER

2-6, LAS VEGAS, NEVADA
"COMDEX/Fall 87," the Ninth National Fall Conference and Exposition for Independent Sales Organizations — and the world's biggest PC show. Info: The Interface Group, Inc., 300 First Avenue, Needham, MA 02194. Tel.: (617) 449 6600, ext. 4013, and 367 0554 (evenings).

CyberLex

This issue's example of language technology in action is an excerpt from Canadian William Gibson's novel Neuromancer. Neuromancer, which has won all the major science fiction awards, has achieved cult status and is being turned into a "mind movie" program by Timothy Leary and his software company Futique, with the help of William Burroughs, Jack Nicholson, Helmut Newton, Devo, Keith Haring, Merril Streep and William Gibson himself. As ever, readers are invited to submit their own suggestions for inclusion in CyberLex, language technology in action.

FRIDAY NIGHT ON NINSEI.

He passed yakitori stands and massage parlors, a franchised coffee shop called Beautiful Girl, the electronic thunder of an arcade. He stepped out of the way to let a dark-suited sarariman by, spotting the Mitsubishi-Genentech logo tattooed across the back of the man's right hand.

Was it authentic? If that's for real, he thought, he's in for trouble. If it wasn't, it served him right. M-G employees above a certain level were implanted with advanced microprocessors that monitored mutagen levels in the bloodstream. Gear like that would get you rolled in Night City, rolled straight into a black clinic.

The sarariman had been Japanese, but the Ninsei crowd was a gaijin crowd. Groups of sailors up from the port, tense solitary tourists hunting pleasures no guidebook listed, Sprawl heavies showing off grafts and implants, and a dozen distinct species of hustler, all swarming the street in an intricate dance of desire and commerce.

There were countless theories explaining why Chiba City tolerated the Ninsei enclave, but Case tended toward the idea that the Yakuza might be preserving the place as a kind of historical park, a reminder of humble origins. But he also saw a certain sense in the notion that burgeoning technologies require outlaw zones, that Night City wasn't there for its inhabitants, but as a deliberately unsupervised playground for technology itself.

From Neuromancer, by William Gibson, copyright 1984; reprinted by permission of the Berkley Publishing Group.